HITACHI

Model V-550B

Oscilloscope

SERVICE MANUAL

Hitachi Denshi, Ltd.

TOKYO, JAPAN

CONTENTS

1. Specifications 1

2. Composition 6

3. Preventive Maintenance 7

4. Calibration 9

5. Disassembly illustration 25

6. Circuit board illustration (with Adjustment Location) ... 27

7. Diagram 29

8. Parts lists 53

o Electrical parts list 53

o Mechanical parts list 100

1. SPECIFICATIONS

o CRT

Type

Hitachi 150BCB31 rectangular mesh type tube with 10 KV acceleration potential and metal backed phosphor

Screen type

P31 (GH) phosphor standard

Useful screen area

8 x 10 div

Graticule

Internal graticule with centimeter divisions and 2mm subdivisions along the centeral axis 10% and 90% lines are indicated. Illumination continuously variable.

Focussing

Possible (with automatic focus correction circuit)

Trace rotation	Present
Scale illumination	Variable
Brightness adjustment	Possible

o Z-AXIS

DC-coupled, positive-going signal decreases intensity: 5Vp-p signal causes noticeable modulation at normal intensity: DC to 3.5MHz.

Input impedance	Approximately 20 kΩ
Maximum input voltage	50 V (DC + AC peak)
Coupling	DC

o VERTICAL DEFLECTION (2 Identical Channels)

Bandwidth and Rise time

DC to at least 50MHz and rise time 7.0ns or less. DC to at least 10MHz and rise time 36ns or less at magnifier extends. Lower -3dB point, AC coupling 10Hz or less. 10x probe: 1Hz or less.

Deflection Factor

5mV/div to 5V/div in 10 calibrated steps, 1-2-5 sequence. Uncalibrated continuous control extends deflection factor to at least 12.5 Volts per division in the 5 Volts/div position. x5 magnifier increases sensitivity of each deflection factor setting to 1mV/div.

Accuracy

±3% (+10° C to +35° C)
±5% (0° C to +50° C)
Additional error for magnifier ±2%

Display modes

CH1, CH2 (normal or invert), Alternate, chopped (250kHz rate), Added

Input Impedance

1M ohm ±2% in parallel with 30pF approx

Maximum Input Voltage

250V (DC+ AC peak) or 500Vp-p AC at 1KHz or less

Input coupling

AC-GND-DC

Delay Line

Permits viewing leading edge of display waveform.

3rd Channel Display (A Trigger View)

Display simultaneously channel 1, channel 2, and external trigger signal. The deflection factor is approx 200mV/div.

Sensitivity	INT: 1/1 ± 30% of screen area
	EXT: 0.2 V/div ± 30%
Frequency band	EXT: DC to 50 MHz (-3dB)
Position	Screen center ± 2 div (trigger level knob is set at the center)

o HORIZONTAL DEFLECTION

Time Base A

50ns/div to 0.5s/div in 22 calibrated steps, 1-2-5 sequence. Uncalibrated continuous control extends deflection factor to at least 1.25 seconds per division in the 0.5 sec/div position. 10x mag extends fastest sweep rate to 5ns/div.

Time Base B

50ns/div to 50ms/div in 19 calibrated steps 1-2-5 sequence. 10x mag extends fastest sweep rate to 5ns/div.

Accuracy

±3% (+10°C to +35 C)

±5% (0°C to +50°C)

Additional error for magnifier ±2%

Horizontal Display Modes

A only, A intensified, B delayed, X-Y

Calibrated Sweep Delay	Continuous calibrated control between 0.5 and 10× time base A setting.
Delay Time Jitter	Better than 1:20,000

o TRIGGERING A AND B

A Trigger Modes

Automatic, Normal, Single sweep, TV-V, TV-H

A Trigger Hold-off

Adjustable control permits a stable presentation of repetitive comples waveform.

A Trigger Source

Internal (Ch1, Ch2), Line, External.

A Trigger Slope

+ or -

Triggering level variable range — For both A and B. Internal; 4div or more. External; approximately ± 2V

Triggering sensitivity and frequency — For both A and B. However, ( ) is only for B

Frequency	Internal	External
DC(30Hz) ~ 10MHz	0.5 div	150 mV
10 MHz ~ 50MHz	1.5 div	500 mV

TV-V sensitivity: SYNC section less than 0.7div or 200mV

AUTO low band : Approximately 30Hz

A Trigger Coupling

AC : 30Hz to full bandwidth

HF REJ: attenuates signals below approx 4KHz

LF REJ: attenuates signals above approx 4KHz

DC : 0 to full bandwidth

A External Trigger Input Impedance

1M ohm ±20% in parallel with 30_{PF} approx (However, setting HF REJ and LF REJ are not included.)

Maximum Input Voltage

250V (DC+ AC peak)

500Vp-p AC at 1KHz or less

B Trigger Modes and Source

Automatic, Normal (Internal, External)

B Trigger Slope

+ or -

Trigger Coupling

AC only; 30Hz to full bandwidth

o X-Y OPERATION (CH1; Horiz, CH2; Vert)

Deflection Factor

Same as vertical deflection

Accuracy

Y: ±3% (+10°C to +35°C), ±5% (0°C to +50°C)

X: ±5% (+10°C to +35°C), ±7% (0°C to +50°C)

Additional error for magnifier ±2%

X-Bandwidth

DC to at least 500kHz

Phase Error

3° or less from DC to 50kHz

o CALIBRATOR

0.5V±1% Frequency 1kHz±5% square wave

Rise time 5μs or less

o POWER SUPPLY

VOLTAGE (50/60Hz)	FUSE
100 V (90 ~ 110 V)	2A
120 V (108 ~ 132 V)	2A
220 V (198 ~ 242 V)	1A
240 V (216 ~ 264 V)	1A

Nominal voltage ± 5% at 400Hz

Power supply frequency. 50, 60, 400Hz

Power consumption Approximately 45W

o ENVIRONMENT

Operating ambient temperature	0° C ~ 50° C
Operating ambient humidity	35% ~ 85%
Specification guaranteed ambient temperature	10° C ~ 35° C
Specification guaranteed ambient humidity	45% ~ 85%

o DIMENSION AND WEIGHT

310w x 180h x 410d mm
(12.2w x 7.1h x 16.1d in)
9.3kg (22lb)

2. COMPOSITION

(1) Model V-550B oscilloscope unit.....1

(2) Probe (AT-10AD 1.5).....2

(3) Fuse (2A for 100V and 120V set
or 1A for 220V and 240V set).....1

(4) Dust proof cover.....1

(5) Power supply cord.....1

(6) Operation Manual.....1

3. PREVENTIVE MAINTENANCE

Preventive maintenance, when performed on a regular basis, can prevent instrument breakdown and may improve the reliability of the oscilloscope. The severity of environment to which this instrument is subjected will determine the frequency of maintenance. A convenient time to perform preventive maintenance is preceding recalibration of the instrument.

Disassembly

Remove the 4 screws in the top cover of the instrument. Gently separate the top cover from the instrument and lay aside. Most of the internal parts of the instrument are now accessible.

If access to the front of the circuit boards are necessary, remove the knobs from the external control shafts on the board. Remove the two screws securing the side panel to the Input circuit board and remove the instrument side panel. (See 5. DISASSEMBLY ILLUSTRATION.)

Cleaning

The instrument should be cleaned as often as operating conditions require. Accumulation of dirt in the instrument can cause component breakdown.

The covers provide protection against dust in the interior of the instrument. Loose dust accumulated on these covers can be removed with a soft cloth or small brush.

Dirt that remains can be removed with a soft cloth dampened in a mild detergent and water solution. Abrasive cleaners should not be used.

Cleaning the interior should only be occasionally necessary. The best way to clean the interior is to blow off the dust with a dry, low-velocity stream of air. A soft-bristle brush or a cotton-tipped applicator is useful for cleaning in narrow spaces or for cleaning more delicate components.

Visual Inspection

The instrument should be inspected occasionally for such defects as broken connections, improperly seated transistors, damaged circuit boards, and heat-damaged parts. The corrective procedure for most visible defects is apparant; however, particular care must be taken if heat-damaged components are found. Overheating usually indicates other trouble in the instrument; therefore, correcting the cause of the overheating is important to prevent recurrance of the damage.

4. CALIBRATION.

Hitachi Denshi, Ltd. provides complete instrument repair and recalibration at our oversea's office, and authorized dealer. Contact your local Hitachi Denshi, Ltd. office or representative.

4.1 TEST EQUIPMENT REQUIRED

The following test equipment and accessories, or equivalent, are required for the complete calibration of the V-550. The given specifications for the test equipment are the minumum necessary for accurate calibration. Therefore, the specifications of any test equipment used must meet or exceed the listed specifications. All the test equipment is assumed to be correctly calibrated and operating within the listed specification. Operating instructions for the test equipment are not given in this procedure. Refer to the instruction manual for the test equipment if more information is needed.

Table 4-1

TEST EQUIPMENT REQUIRED

Description	Minimum Specification	Usage	Examples of Applicable Test Equipment
1. Constant Amplitude Signal Generator	50kHz reference frequency; maximum frequency 70MHz; variable amplitude.	Check horizontal, vertical and trigger bandwidth.	
2. Standard Amplitude Calibrator	Amplitude accuracy: 0.25%, variable amplitude; 5mV to 40 V; frequency: 1 kHz squre wave.	Check horizontal and vertical gain.	
3. Square-wave Generator	Variable frequency: 10 Hz to 1 MHz; output amplitude; 10 mV to 100 V.	Check probe and vertical compensation.	
4. Digital Multimeter	0.1% accuracy.	Check power supply	
5. Time Mark Generator	0.1% accuracy.	Check horizontal timing.	
6. Cable	Impedance, 50 ohms; type, RG-58/U; length, 42 inches, connectors, BNC	External trigger operation check. Horizontal gain check and adjustment.	Hitachi Part No.4202
7. Termination	Impedance, 50 ohms; connectors, BNC	Vertical Amplifier compensation checks and adjustment.	Hitachi Part No.1401
8. Attenuator	Ratio, 10X; connectors, BNC; impedance, 50 ohms.	Vertical Amplifier bandwidth check.	Hitachi Part No.1501
9. T-Connector	Connectors, BNC.	External trigger operation checks.	Hitachi Part No.1301

4.2 PRELIMINARY PROCEDURE

This instrument should be calibrated at an ambient temperature of +20°C (±5°C) for best overall accurary.

1. Connect the instrument to AC line voltage, 50/60/400 Hz line source.
2. Set the instrument controls as given in the Preliminary Control Settings. Allow at least fifteen minutes of warmup before proceeding.
3. See the Adjustment Locations in the pullout pages.

4.3 PRELIMINARY CONTROL SETTINGS

Preset the instrument controls to the settings given below, when starting the calibration procedures.

FOCUS	Midrange	FINE	Midrange
TRACE ROTATION	As desired	VAR HOLD OFF	Fully counterclockwise
V. POSITION	Midrange, push in	SWP VAR	Fully counterclockwise, push in
V. VARIABLE	CAL, fully clockwise	DISPLAY	A
AC-GND-DC	GND	- B TRIG -	
VOLTS/DIV	5mV/DIV	SOURCE	AUTO
V. MODE	CH1	LEVEL	Midrange, push in
TRIPLE	Normal (Button Out)	- A TRIG -	
INV	Normal (Button Out)	LEVEL	Midrange, push in
SCALE ILLUM	Fully counterclockwise	RESET	Normal
H. POSITION	Midrange	MODE	Auto
PULL X10 MAG	Midrange, push in	COUPLING	AC
TIME/DIV A	1mS	SOURCE	CH1
DLY TIME MULT	Midrange		

4.4 INITIAL STARTING PROCEDURE

1. Rotate POWER/INTENSITY control to the midrange.
2. Wait a few seconds for the cathode ray tube (CRT) to warm up. A trace should appear on the display of the CRT.
3. If trace disappears, increase (clockwise) the POWER/INTENSITY control setting until the trace is easily observed.
4. Adjust FOCUS control for the best focused display.
5. Readjust POSITION controls if necessary, to center the trace.

POWER SUPPLY SYSTEM

NOTE

Before you begin, see ADJUSTMENT LOCATIONS in the pullout pages.

Control Settings

Preset the controls as given in the Preliminary Control Setting.

1-(1) Check Low-voltage Supply, if necessary

a. Connect the digital voltmeter (DVM) from the +12 volt line.
: +11.975 V to +12.025 V (IC 1111)

b. Connect the DVM from the -12 V line
: -11.75 V to -12.25 V (IC 1121)

c. Connect the DVM from the +5V line
: +4.75 V to +5.25 V (IC 1131)

d. Connect the DVM from the +99 V
: +97 V to +101 V(TR1101-Emitter)

e. Connect the DVM from the 150 V
: +140 V to +160 V

1-(2) Adjust Low-voltage Supply

Adjust the adjustment RV1111 for DVM reading of +12V ($\pm$0.025V).

2. Check High Voltage Supply

a. Connect the DVM to the H.V test point (D1024-Kathode) by High Voltage Probe.

b. Check for a reading of -1405 V ~ -1495 V

DISPLAY

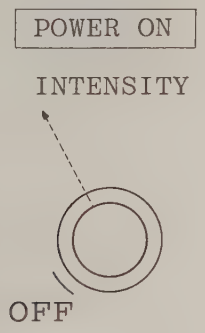
Control Setting

Preset the controls as given in the Preliminary Control Setting.

3. Check/Adjust Grid Bias

a. DISPLAY switch to the [X-Y] position, and Vertical Mode switch to the CH2 [X-Y] position.

b. Rotate the POWER/INTENSITY to the "I" letter of the "INTENSITY" as shown.



c. When small spot appears, use the POSITION control to place spot at center of screen.

d. Adjust Grid Bias Adjustment RV1021 to obtain small, round spot.

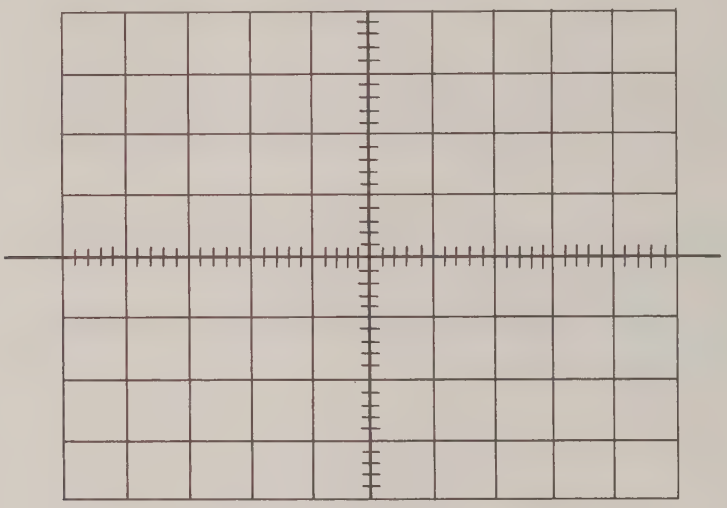
4. Check/Adjust Trace Rotation

a. Set the A TIME/DIV switch to 1mS.

b. Check that the trace is parallel to the center horizontal line.

c. DISPLAY switch to the A position.

d. Adjust TRACE ROTATION for a trace that is parallel with the horizontal graticule lines.



5. Check/Adjust GEOMetry

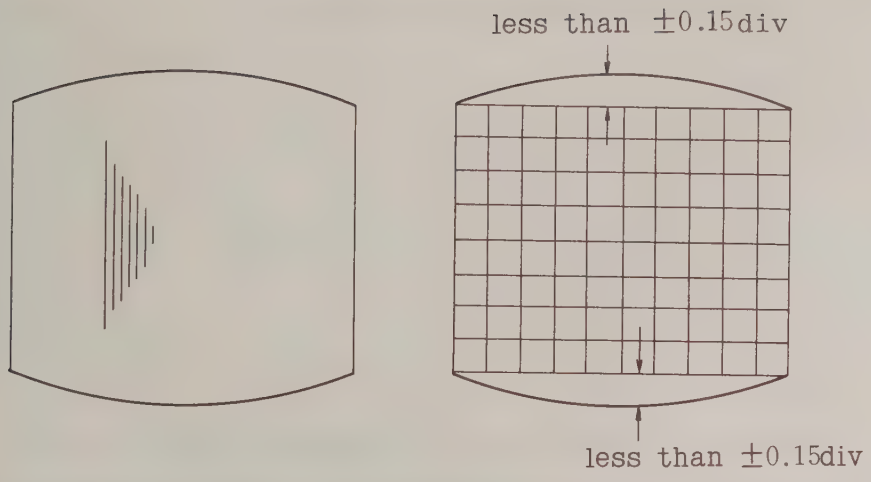
a. Set the A TIME/DIV switch to the 1mS,and AC-GND-DC to DC.

b. Connect the Constant Amplitude Signal Generator to the input.

c. Set the VOLTS/DIV switch setting for a full-screen (8 division) deflection.

d. Check that horizontal bowing is less than $\pm$0.15 division.

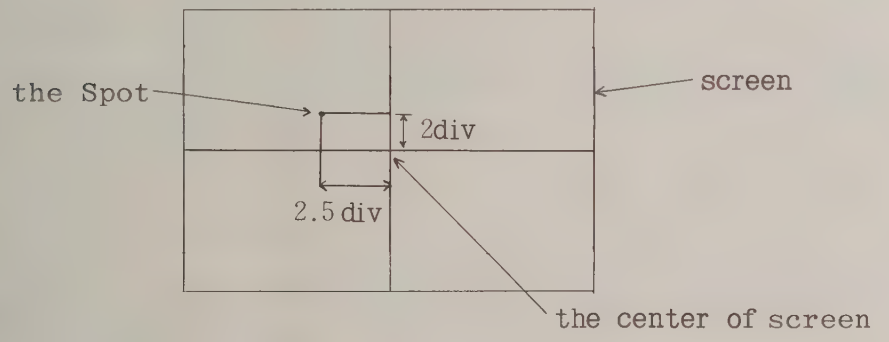
e. Adjust the GEOM adjustment RV1033 for a display that is parallel with top and bottom horizontal lines.



6. Check/Adjust ASTIGmatism and FOCUS.

   a. Vertical Mode switch to the CH2 [X-Y] position, and Display switch to the [X-Y] position, and AC-GND-DC to DC.

   b. Set the [POWER ON] INTENSITY control for a small spot, as the following figure, using position controls.



   c. Check that the spot is round.

   d. Adjust the FOCUS adjustment and the ASTIG adjustment RV1032 for a round spot.

HORIZONTAL SYSTEM

Control Settings

Preset the controls as given in the Preliminary Control settings.

7. Check/Adjust Horizontal Gain (Sweep Cal.)
   a. Set the A TIME/DIV switch to the 1mS.
   b. Set the input AC-GND-DC to DC.
   c. DISPLAY switch to the A position.
   d. Connect the cable to the output of the time mark generator.
   e. Set the time mark generator for 1mS time marks.
   f. Check that the time marks align with the graticule lines over the center eight divisions.
   g. Adjust H GAIN adjustment RV830 so that the time marks align with the center eight graticule lines.
   h. Check all other ranges of timing within 3%. Use appropriate settings on the time mark generator.
   i. DISPLAY switch to the B position, set the A TIME/DIV switch to the 2mS and the B TIME/DIV switch to the 1mS.
   j. Refer part (e) through (h) (in this case, adjust B Sweep CAL adjustment RV734).

8. Check/Adjust Horizontal X10 MAG Gain
   a. Set X10 MAG (Pull out the inner knob of the POSITION control).
   b. Refer item 5 part (a) through (e).
   c. Adjust MAG GAIN adjustment RV831 for one-cycle time marks align with the ten-divisions graticule lines.

d. Push in the inner of the POSITION control after the adjustment and check.

9. Check/Adjust MAG CENT.

   a. Set the A TIME/DIV switch to the 0.1mS.

   b. Being the inner shuft of H. POSITION is in pulled out state (X10 MAG), the left end of the trace is brought to the center point and then the inner shuft of H. POSITION is depressed.

   c. Observe the movement of the left end of the trace.

   d. Adjust the MAG CENT Adjustment RV842 for the movement of the left end of the trace within $\pm$0.2 div.

10. Check/Adjust High speed sweep accuracy.

   a. Set the A TIME/DIV switch to 0.1 μ S.

   b. Refer item 5 part (b) through (d).

   c. Set the time mark generator for 0.1 μ S time marks.

   d. Refer item 5 part (f).

   e. Adjust CV514 at that the time marks align with center eight graticule lines.

   f. Refer item 5 part (h).

   g. DISPLAY switch to the B position.

   h. Set the A TIME/DIV switch to the 0.5 μ S and the B TIME/DIV switch to the 0.1 μ S.

   i. Refer part (c) through (f) (in this case, adjust CV 701).

   j. Set the A TIME/DIV switch to 10 μ S.

   k. Refer part (b).

   l. Set the time mark generator for 10 μ S time marks.

m. Refer (d) through (f) (in this case, adjust CV 564.

n. DISPLAY switch to the B position.

o. Set the A TIME/DIV switch to the 50 μS, and the B TIME/DIV switch to the 10 μS.

p. Refer (h) through (i) (in this case, adjust CV729).

11. Check/Adjust Delay time

a. Set the A TIME/DIV switch to 1mS, and the B TIME/DIV switch to 1μS.

b. Set the DISPLAY switch to INTEN position.

c. Connect the cable to the output of the time mark generator.

d. Set the time mark generator for 1mS time marks.

e. Check that the reading of the DLY TIME MULT dial is 0.3 when the dial is fully counterclockwise.

f. Set the DLY TIME MULT dial to 1.0.

g. Check that the second time mark is bright.

h. Adjust RV556 so that the second time mark is bright when the dial reading is 1.0.

i. Set the dial to 9.0.

j. Check that the tenth time mark is bright.

k. Adjust RV555 so that the tenth time mark is bright when the dial reading is 9.0.

VERTICAL SYSTEM

Control Setting

Preset the controls as given in the Preliminary Control Settings.

12. Check/Adjust DC Balance (Step attenuator balance).

    a. Set the VOLTS/DIV switch to the 5mV position.

    b. Position the trace to the horizontal center line.

    c. Change the VOLTS/DIV switch to the 10mV position.

    d. Check that the trace is within 0.1 division of the center horizontal line.

    e. Adjust the CH1(CH2) ATT BAL adjustment, RV27(CH1) or RV127(CH2), for a trace at the horizontal center line.

    f. Repeat part (a) through (e) until less than 0.1 division shift is noted when changing the VOLTS/DIV setting.

13. Check/Adjust Vertical Position Center.

    a. Confirm the vertical POSITION control at the midrange.

    b. Check the trace is within 1 division.

    c. Adjust the Position Center adjustment RV97(CH1), RV197(CH2) for a trace at the horizontal center line.

14. Check/Adjust X1 AC GAIN.

    a. Set the A TIME/DIV switch to the 1mS position.

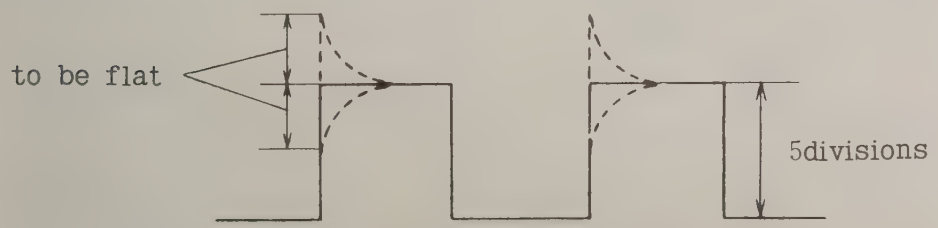
    b. Set the VOLTS/DIV switch to the 10mV position.

    c. Set the AC-GND-DC switch to DC.

    d. Connect the Square-wave Generator (using 1KHz out put range).

    e. Adjust the output amplitude of that generator for 5 division deflection of screen.

    f. Check the high-voltage level of pulse is flat.



g. Adjust the X1 AC GAIN RV33(CH1), RV133(CH2) adjustment for a flat level.

15. Check/Adjust Vertical Gain.

a. Set the A VOLTS/DIV switch to the 10mV position and AC-GND-DC switch to DC.

b. Connect the standard amplitude calibrator to the input.

c. Set the standard amplitude calibrator for a $50mV_{p-p}$ (5 divisions of display) signal.

d. Check for a display of five divisions.

e. Adjust GAIN adjustment RV84(CH1), RV184(CH2) for a display of 5 divisions within 3%.

f. Check all the VOLTS/DIV switch settings.

16. Check/Adjust Vertical Step Response.

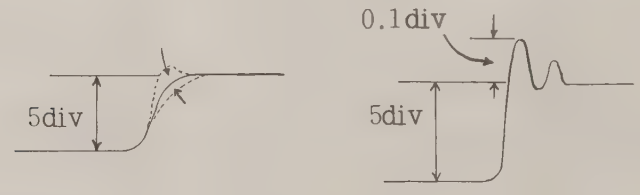
a. Set the VOLTS/DIV switch to the 10mV position.

b. Set the A TIME/DIV switch to the 0.5 μS position.

c. Connect the fast-rise, positive output (50mV, 1MHz) of the square-wave generator to input. Use a 50-ohm termination and cable.

d. Set the square-wave generator to 1MHz. Adjust the square-wave generator output for a 5-divisions display.

f. Adjust CV329 (at A TIME/DIV:0.2 μS), CV322 (at 0.1 μS) for a square wave that is flat.
And Adjust CV304(CH1) (at A TIME/DIV:50nS), CV182(CH2) (at A TIME/DIV:50nS) for over-shoot that is +0.1div.



17. Check/Adjust Attenuation Compensation.

a. Set the VOLTS/DIV switch to the 0.1V position and AC-GND-DC switch to DC.

b. Connect the square-wave generator to the input for a 0.5V signal.

c. Check for a square wave that is flat (flat top).

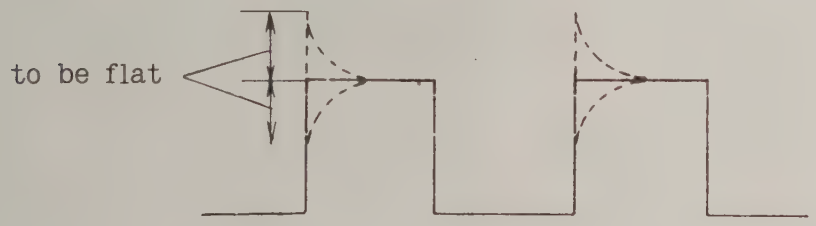
d. Adjust CV7(CH1), CV107(CH2) for a square wave that is flat (flat top).

e. Set the VOLTS/DIV switch to the 1V position.

f. Set the square-wave generator for a 5V signal.

g. Check for a square wave that is flat.

h. Adjust CV12(CH1), CV112(CH2) for a square wave that is flat.



18. Check/Adjust Input Capacity

a. Connect the L-C meter to Input terminal.

b. Check the Input capacity for a approximately 30pF.

c. Adjust the following trimmer condenser for a 30pF Input capacity under the following settings.

ATT	VOLT/DIV	Adjust	
		CH1	CH2
÷ 1	10mV	CV22	CV122
÷ 10	0.1V	CV6	CV106
÷ 100	1V	CV11	CV111

19. Check/Adjust TRIG CENT

a. Set A TRIG SOURCE switch to CH1, A TRIG COUPLING switch to AC, A TRIG SLOPE knob push in, the VOLTS/DIV switch to 50mV, the A TIME/DIV switch to 20μs.

b. Connect the sine-wave generator to the input for a 0.5div (50kHz).

c. Set TRIG LEVEL knob so that synchronization is effected on the waveform, 0.5div on the screen.

d. Under the state of (C), if synchronization is not effected by switching A TRIG COUPLING to "DC", set CH1(CH2) TRIG BAL RV64 (CH1) and RV164 (CH2) so that synchronization is effected.

e. Next, set A TRIG SLOPE to -(pulled out state) and insure that synchronization is effected. After confirmation, leave A TRIG-SLOPE in depressed state. Readjust when stepped out.

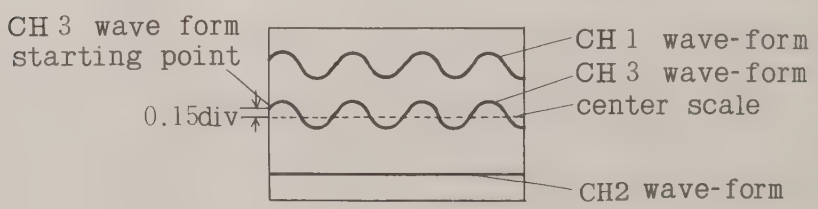
20. Check/Adjust CH3 CENT

a. Set the V MODE switch to ALT.

b. Push the TRIPLE switch on.

c. Check the initial point of CH3 waveform sweep is identical with the center horizontal division.

d. Adjust the CH3 CENT adjustment RV204 so that the starting point of CH3 waveform comes to the 0.15 div on the center horizon scale.



21. Check/Adjust EXT TRIG Step Response.

a. Set the A TRIG SOURCE switch to the EXT position, the A COUPLING switch to the DC point, the A MODE switch to the AUTO position, the B TRIG SOURCE switch to the EXT position, and push the TRIPLE switch in.

b. Connect the square-wave Generator (using 1kHz out put range) to A EXT TRIG terminal. Use a 50-ohm termination and cable.

c. Check the high-voltage level of pulse is flat.

e. Adjust CV402 for a flat level.

22. X-Y Operation

22-1. Check/Adjust X Gain.

a. Set the vertical MODE Switch to CH2 [X-Y], the DISPLAY switch to [X-Y], the AC-GND-DC switch of CH1 to DC, the AC-GND-DC switch of CH2 to GND.

b. Set the VOLTS/DIV switch to the 10mV position, with X1 GAIN.

c. Connect the standard amplitude calibrator to the CH1 input.

d. Set the standard amplitude calibrator for a 50mV.

e. Check for a display of 5 divisions.

f. Adjust the X GAIN adjustment RV591 for a display of 5 divisions.

22-2. Check/Adjust X Position Center

a. Set the DISPLAY switch to [X-Y] position, the vertical MODE switch to CH2/ [X-Y] position and the horizontal POSITION control to midposition, the AC-GND-DC switch of CH1 to GND.

b. Check to see that round spot is near the center graticule and is within 0.2 division against horizontal line.

c. Adjust the X CENT adjustment RV590 to position spot at the center.

23. Check/Adjust CAL terminal ($0.5V_{p-p}$, 1kHz)

a. Set the VOLTS/DIV switch to the 0.1V position, the A TIME/DIV switch to the 1mS.

b. Connect the CAL to the input.

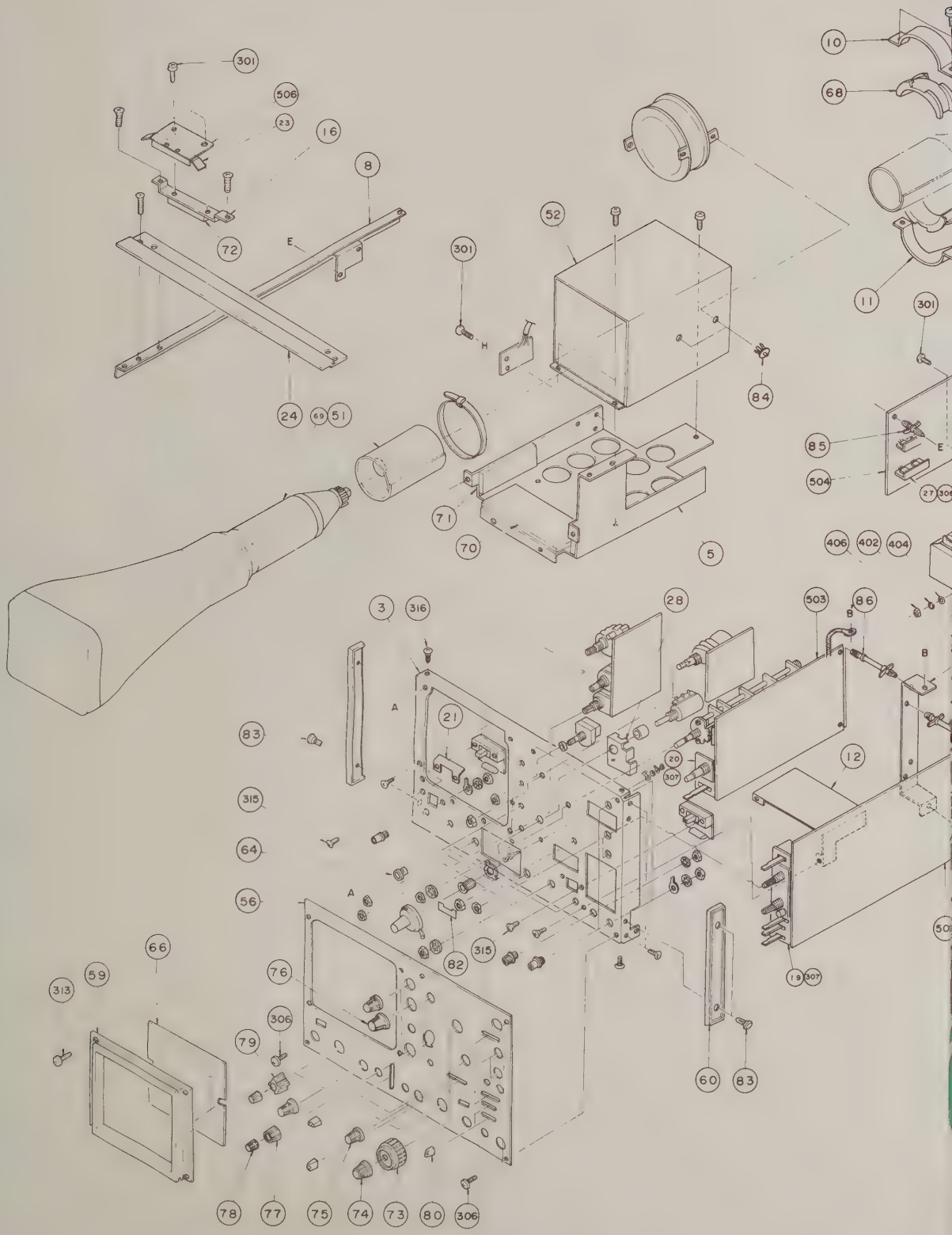
c. Check the deflection of 10th div on the screen is 0 as 1 period is 1div.

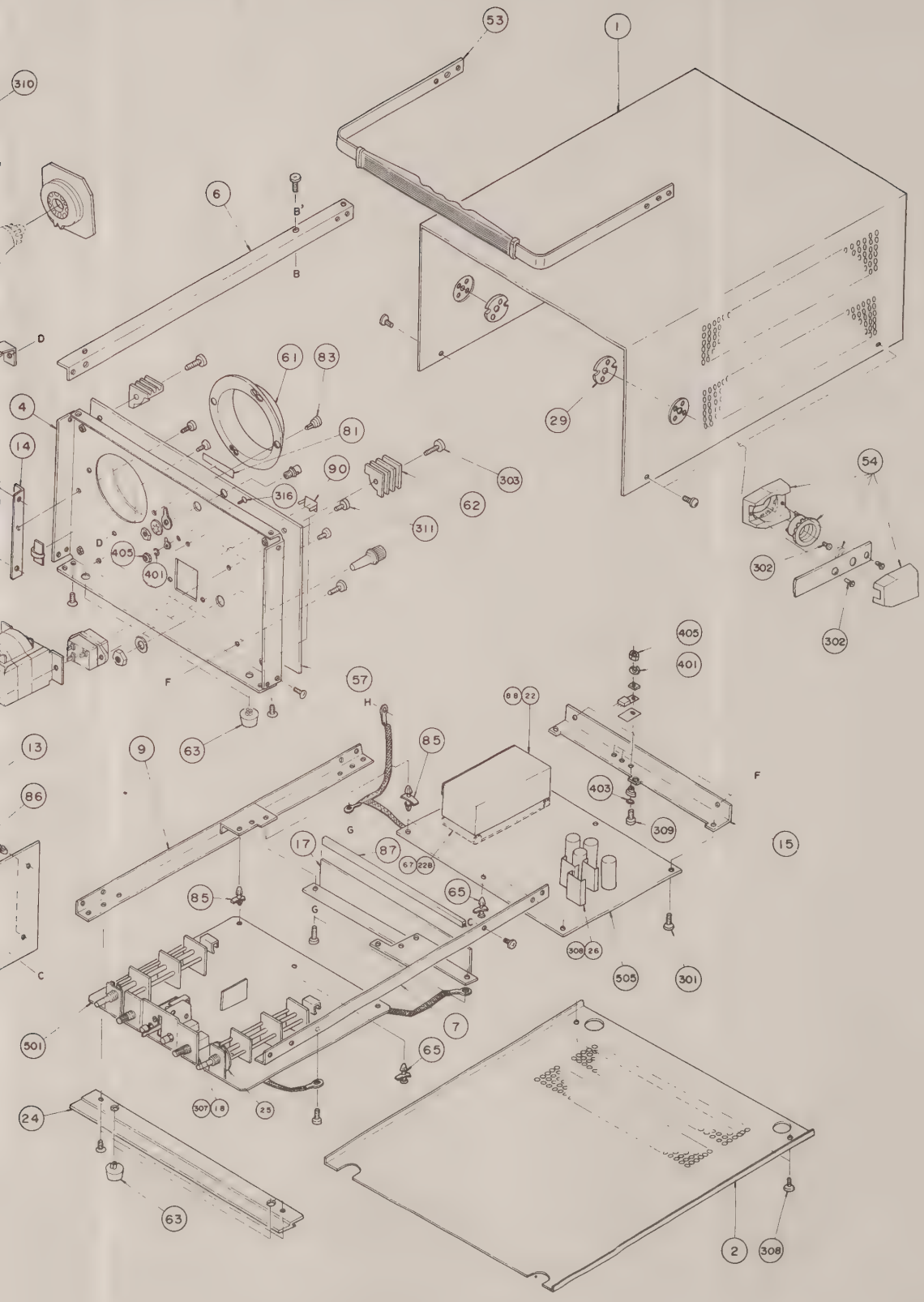
d. Adjust RV1203 for the deflection of 10th div on screen.

e. Check for a display of five divisions.

f. Adjust RV1205 for a display of 5 divisions within 1%.

5. Disassembly illustration




53
1
310
6
B'
B
D
61
83
4
81
14
90
316
303
62
311
D
403
401
F
29
54
302
302
405
401
57
H
88
22
13
9
63
85
403
F
86
309
G
17
87
67
228
15
85
65
G
C
308
26
505
301
C
501
7
65
307
18
25
24
63
2
308

6. CIRCUIT BOARD ILLUSTRATION

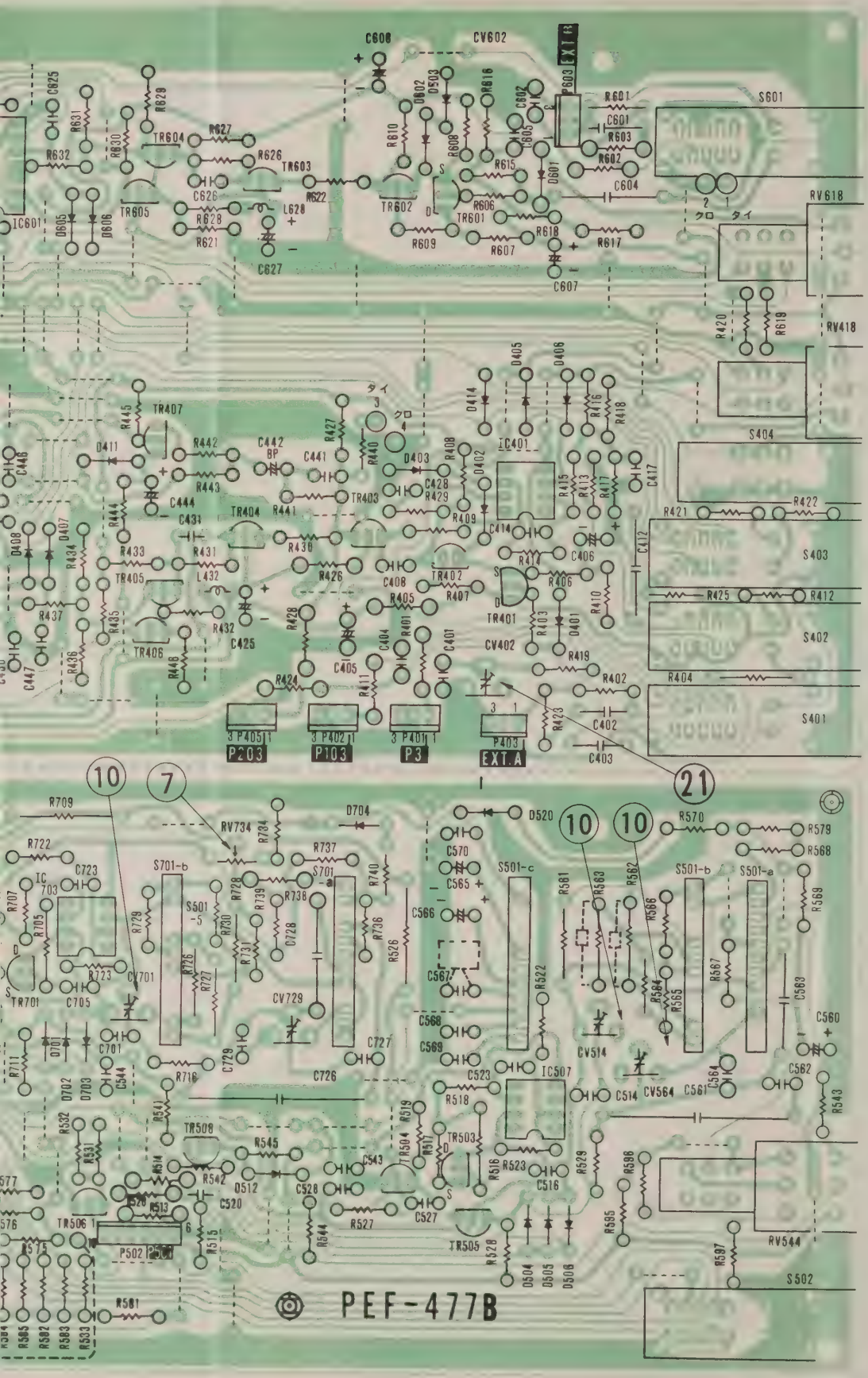
(with Adjustment Location)

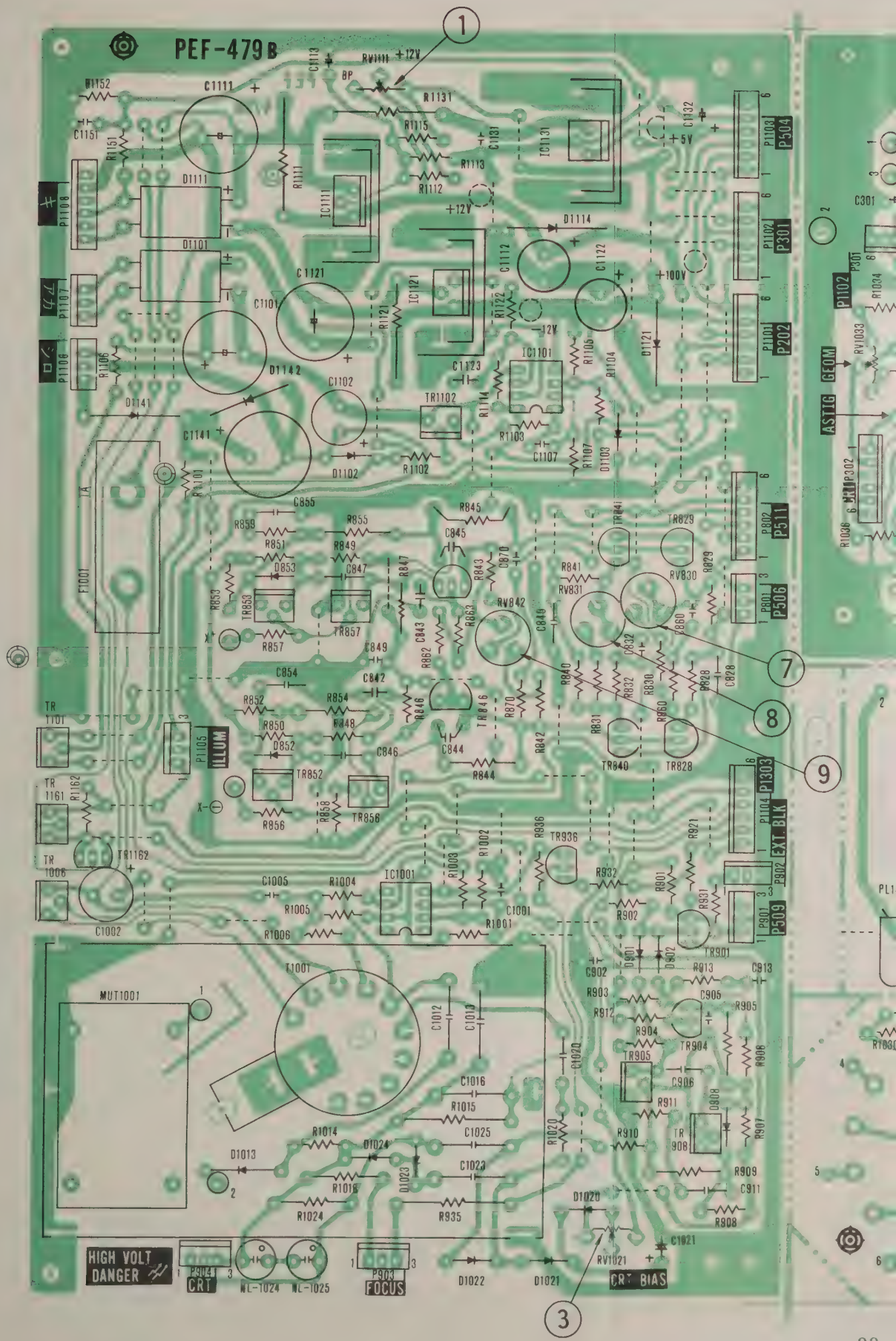
19
CH1 TRIG BAL
RV64
15
GAIN
RV84
13
CH1POS CENT
RV97
14
X1AC GAIN
18
CV22
17
CV12
17
CV7
CH1 ATTBAL
CV11
CV6
18
12
18
P401
P508
DELAY LINE
P204
L74
TR17
TR15
TR5
TR6
TR8
TR7
TR205
TR206
TR4
TR3
TR1
TR2
IC201
IC1
S2-1
S2-2
S2-3
S202
L34
RV98
RV33

P101
P202
P205
P203
P402
P103
C225
C204
R201
R205
R203
C170
R171
C171
D103
R164
CH2 TRIG RAL
TR203
R211
C211
TR201
R209
C224
R167
C168
TR117
R207
R206
R202
RV204
C167
R166
TR116
RV164
19
C215
R213
R214
R215
TR204
R212
TR202
C206
R204
R210
CH3 CENT
R170
C173
R165
TR115
R162
R163
20
CH3 CENT
R181
R172
C172
TR107
R192
R178
R187
TR 105
R185
R184
15
GAIN
R190
R191
TR108
TR109
R173
C187
R193
TR106
R182
RV184
R175
R188
R186
16
C189
CV182
R185
R194
TR110
R189
C182
R198
R197
13
CH2 POS CENT
R196
RV197
C183
C143
C196
R149
R162
R141
C141
C151
R150
C152
C156
TR 104
RV155
R155
X1 AC GAIN
R143
R142
14
RV133
C132
R151
R156
R144
C142
R168
E102
E101
D102
R132
R158
C137
R139
R181
C131
R133
R137
R159
R154
R153
R157
C186
R131
PEF-475
R148
TR103
R136
R135
TR101
C124
R124
C121
R134
C129
R125
C147
TR102
D101
R117
C120
R147
R129
R123
CV122
17
R126
R120
C123
R122
R130
R128
P510
IC101
C118
CV122
R104
R138
R127
D104
R121
R116
C116
C117
C135
CV112
17
C127
R107
C113
R115
R114
R113
C109
R110
C112
CV112
ATT BAL
17
L134
CH2 ATT RAL
R105
R109
R108
CV107
R112
C114
CV107
S103
R119
R127
R110
S102-1
P102
R139
R106
R103
CV106
RV100
C103
CV111
C118
CV106
R111
CN1
R140
18
11
CV111
17

PEF-476B

PEF-478

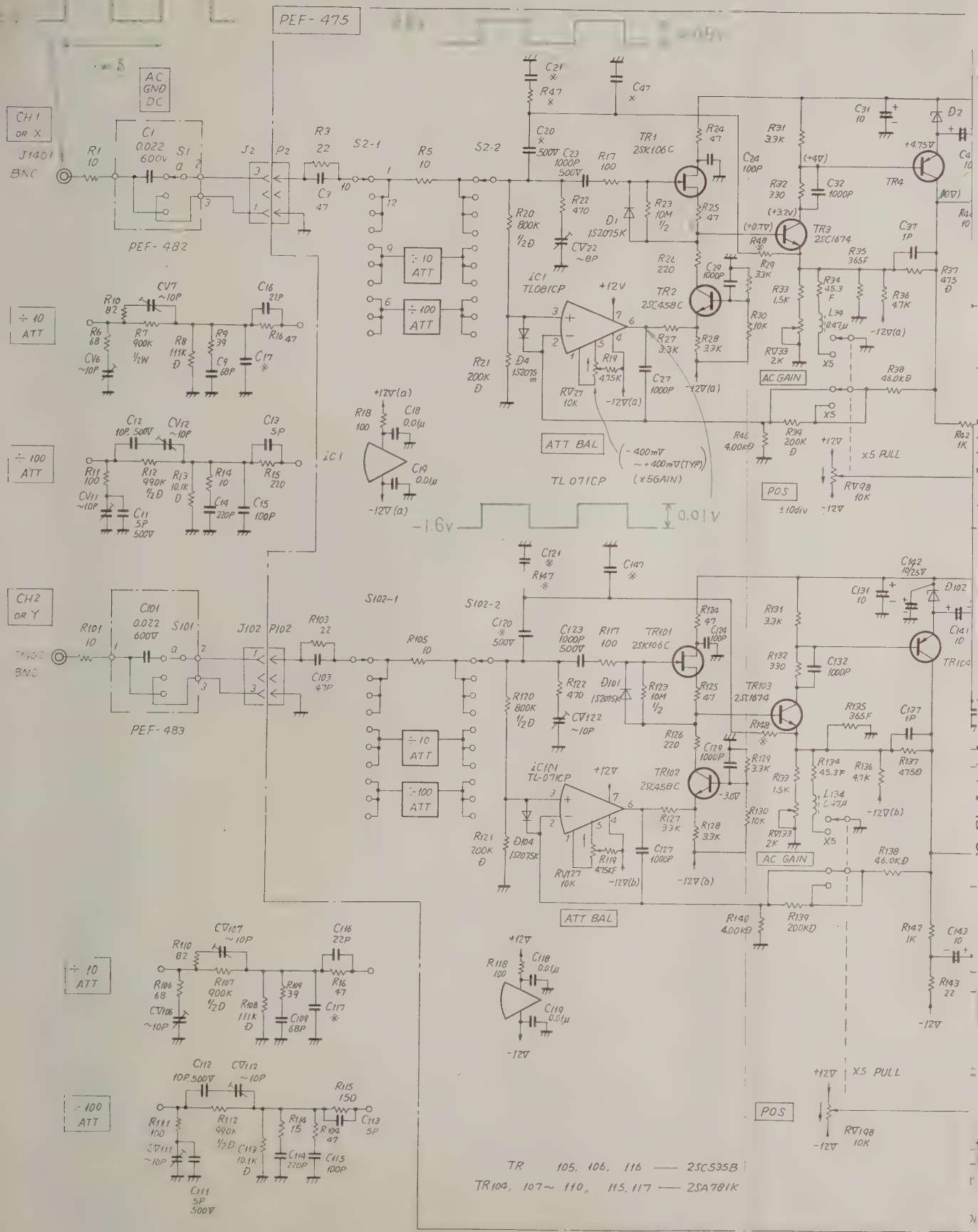

PEF-477B
P203
P103
P3
EXT.A
S601
S404
S403
S402
S401
S501-b
S501-c
S501-a
S701-b
S701-a
S502
RV618
RV418
RV544
IC401
IC507
IC703
TR401
TR402
TR403
TR404
TR405
TR406
TR407
TR408
TR501
TR502
TR503
TR504
TR505
TR506
TR508
TR601
TR602
TR603
TR604
TR605
TR701
CV402
CV514
CV564
CV602
CV701
CV729
C608
C627
C607
C604
C601
C603
C602
C605
C606
C609
C610
C611
C612
C613
C614
C615
C616
C617
C618
C619
C620
C621
C622
C623
C624
C625
C626
C628
L628
L432
D401
D402
D403
D405
D406
D407
D408
D411
D414
D501
D502
D503
D504
D505
D506
D512
D520
D605
D606
D701
D702
D703
D704
R601
R602
R603
R604
R605
R606
R607
R608
R609
R610
R611
R612
R613
R614
R615
R616
R617
R618
R619
R620
R621
R622
R623
R624
R625
R626
R627
R628
R629
R630
R631
R632
R401
R402
R403
R404
R405
R406
R407
R408
R409
R410
R411
R412
R413
R414
R415
R416
R417
R418
R419
R420
R421
R422
R423
R424
R425
R426
R427
R428
R429
R430
R431
R432
R433
R434
R435
R436
R437
R438
R439
R440
R441
R442
R443
R444
R445
R446
R447
R448
C401
C402
C403
C404
C405
C406
C407
C408
C409
C410
C411
C412
C413
C414
C415
C416
C417
C418
C419
C420
C421
C422
C423
C424
C425
C426
C427
C428
C429
C430
C431
C432
C433
C434
C435
C436
C437
C438
C439
C440
C441
C442
C443
C444
C445
C446
C447
C448
R501
R502
R503
R504
R505
R506
R507
R508
R509
R510
R511
R512
R513
R514
R515
R516
R517
R518
R519
R520
R521
R522
R523
R524
R525
R526
R527
R528
R529
R530
R531
R532
R533
R534
R535
R536
R537
R538
R539
R540

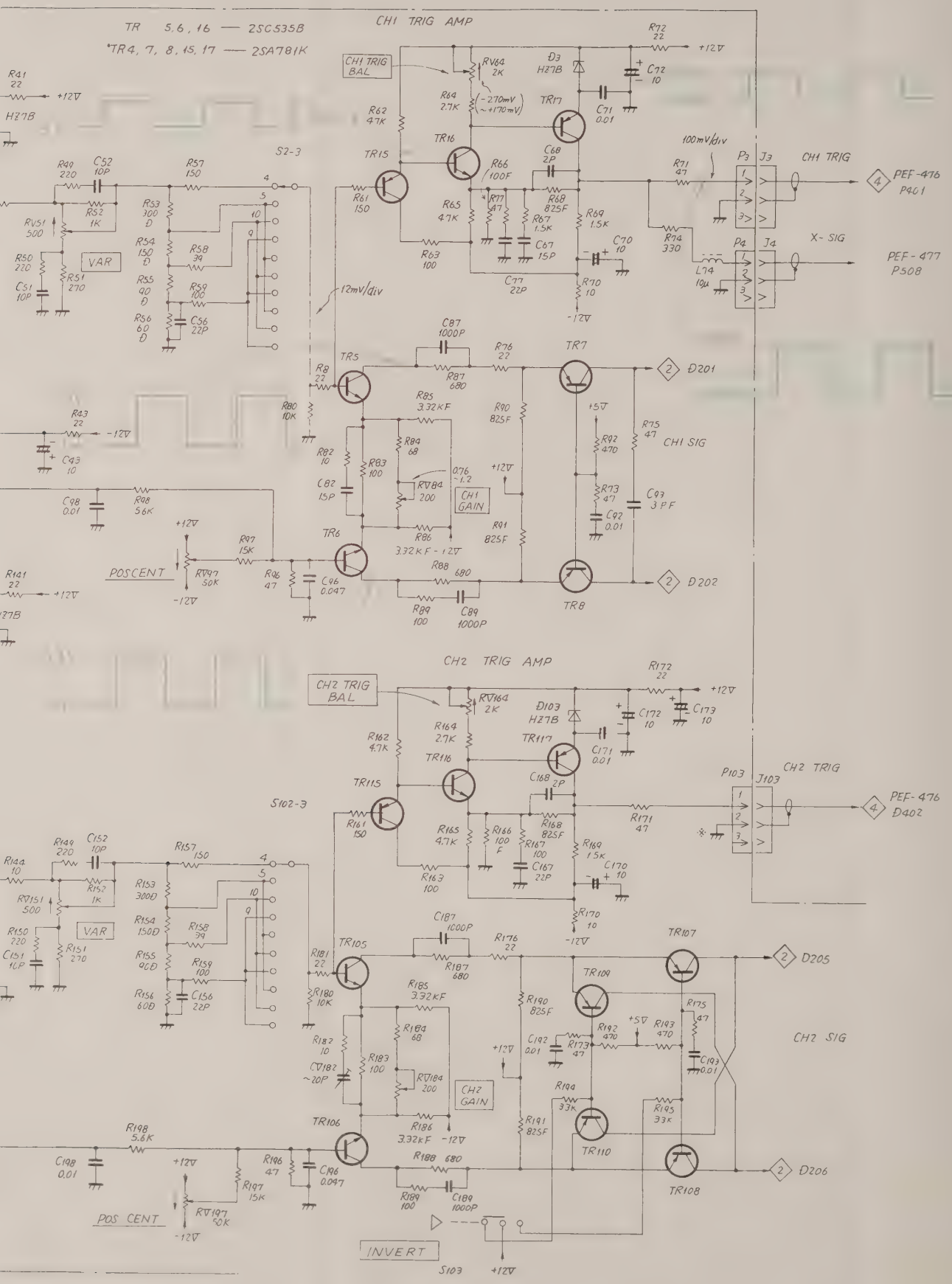

PEF-479B
1
7
8
9
3
+12V
+5V
+100V
-12V
RV1111
C1111
D1111
D1101
IC1111
IC1131
IC1101
C1121
D1142
D1141
C1102
D1102
TR1102
IC1121
D1114
C1141
IC1001
T1001
MUT1001
TR840
TR828
TR852
TR856
TR857
TR853
TR936
TR901
TR904
TR905
TR908
TR1162
P1105
ILLUM
P1303
EXT. BLK
P1104
P504
P301
P202
P511
P506
P509
P1102
P1101
P1103
P1107
P1108
P1106
P1001
P1002
P1003
P1004
P1005
P1006
P1007
P1008
P1009
P1010
P1011
P1012
P1013
P1014
P1015
P1016
P1017
P1018
P1019
P1020
P1021
P1022
P1023
P1024
P1025
P1026
P1027
P1028
P1029
P1030
P1031
P1032
P1033
P1034
P1035
P1036
P1037
P1038
P1039
P1040

16
16
16
23
23
PEF-478
PEF-486
PEF-485
PEF-484b
PEF-481
PEF-480B
TEST
CAL
R COIL
P1104
P802
P505
RV557
PL1402
PL1401
11

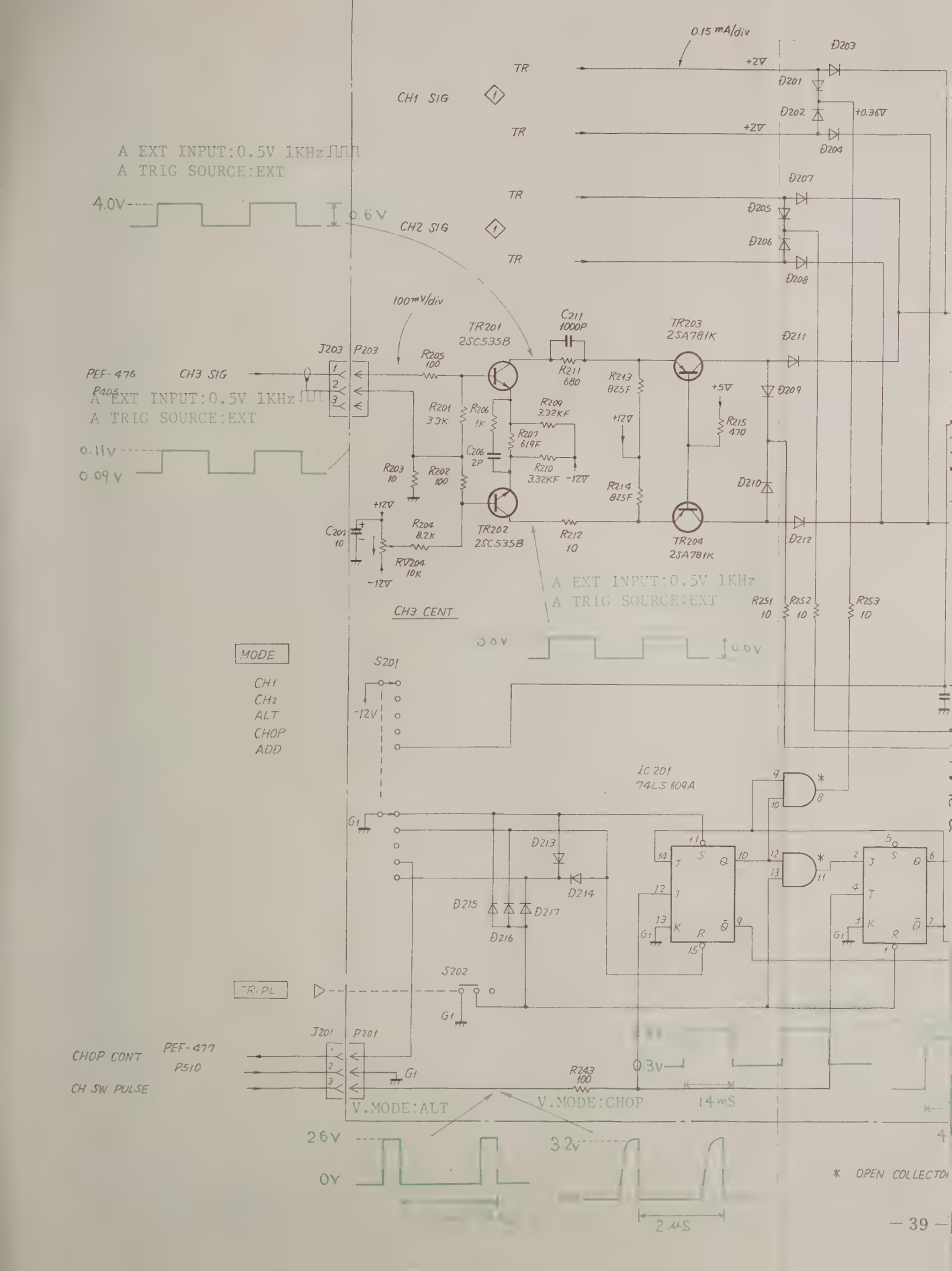
7. DIAGRAM

※ Refer to ELECTRIC PARTS LIST, when this simbol is remarked

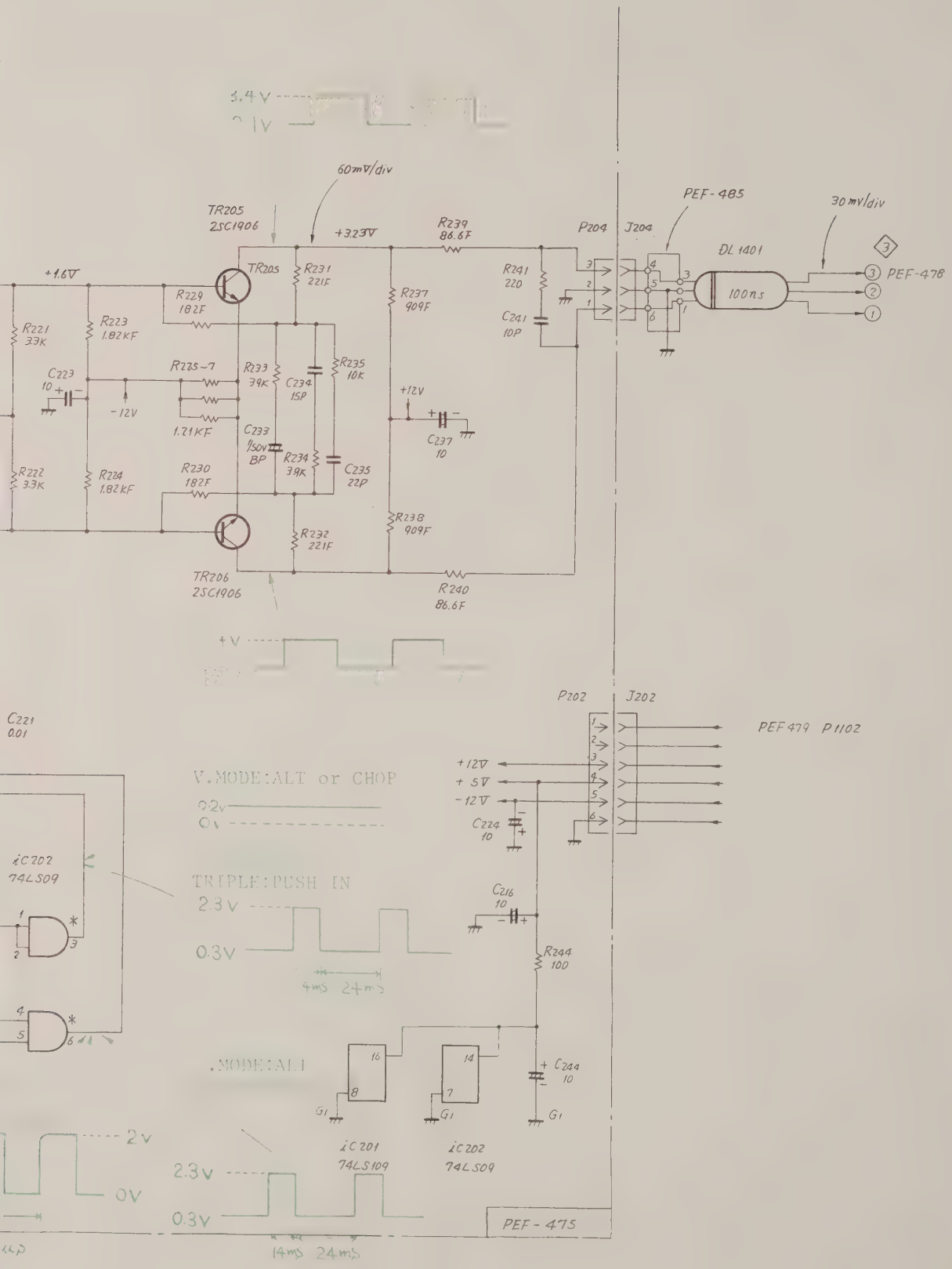

PEF-475
AC GND DC
CH1 OR X
J1401 BNC
PEF-482
÷10 ATT
÷100 ATT
S1
S2-1
S2-2
AC GAIN
ATT BAL
POS
X5 PULL
TL071CP
(x5GAIN)
CH2 OR Y
PEF-483
TR1 2SK106C
TR2 2SC458C
TR3 2SC1674
TR4
TR101 2SK106C
TR102 2SC458C
TR103 2SC1674
TR104
TR 105, 106, 116 —— 2SC535B
TR104, 107~110, 115, 117 —— 2SA781K



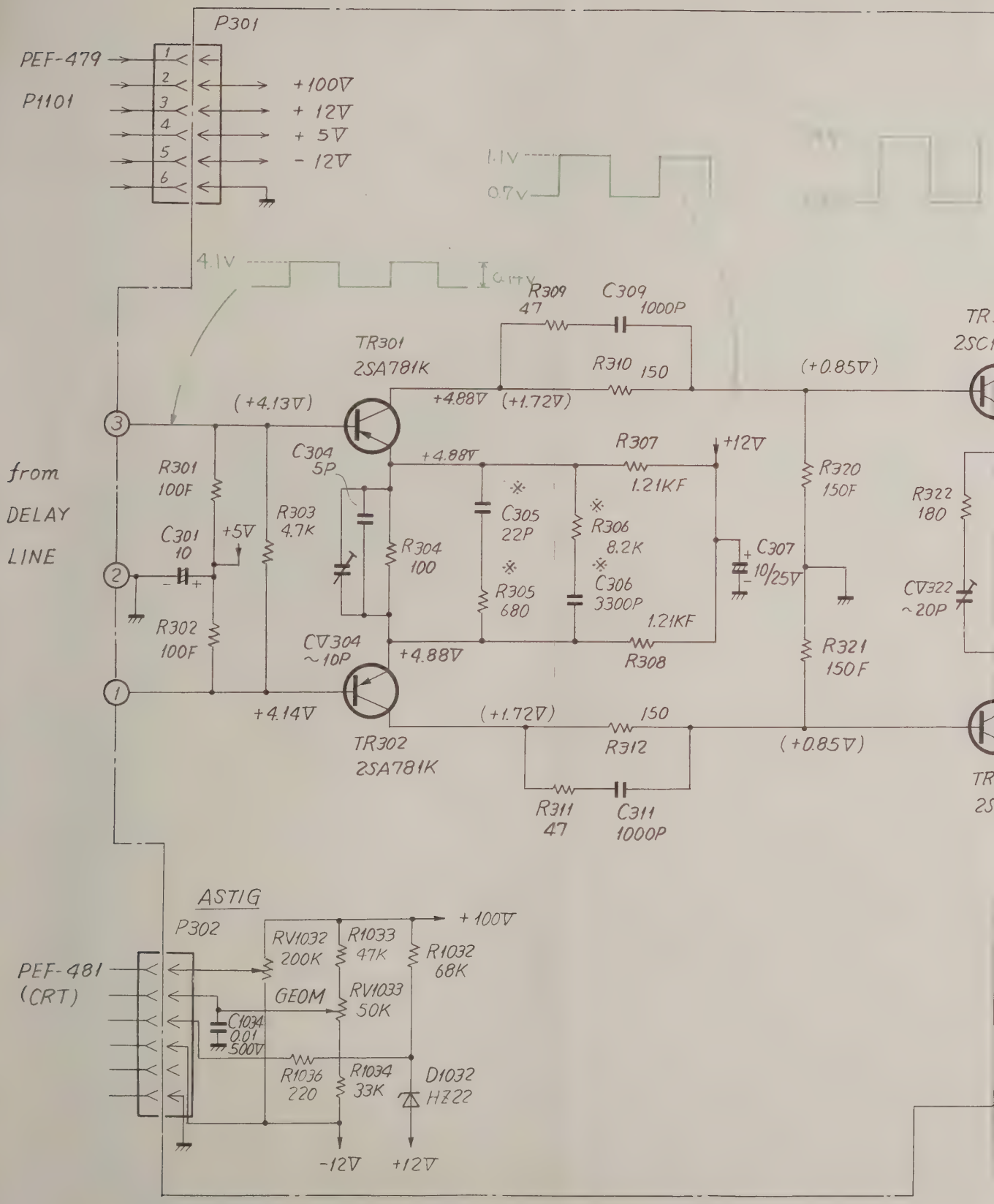
VERTICAL PREAMPLIFIER

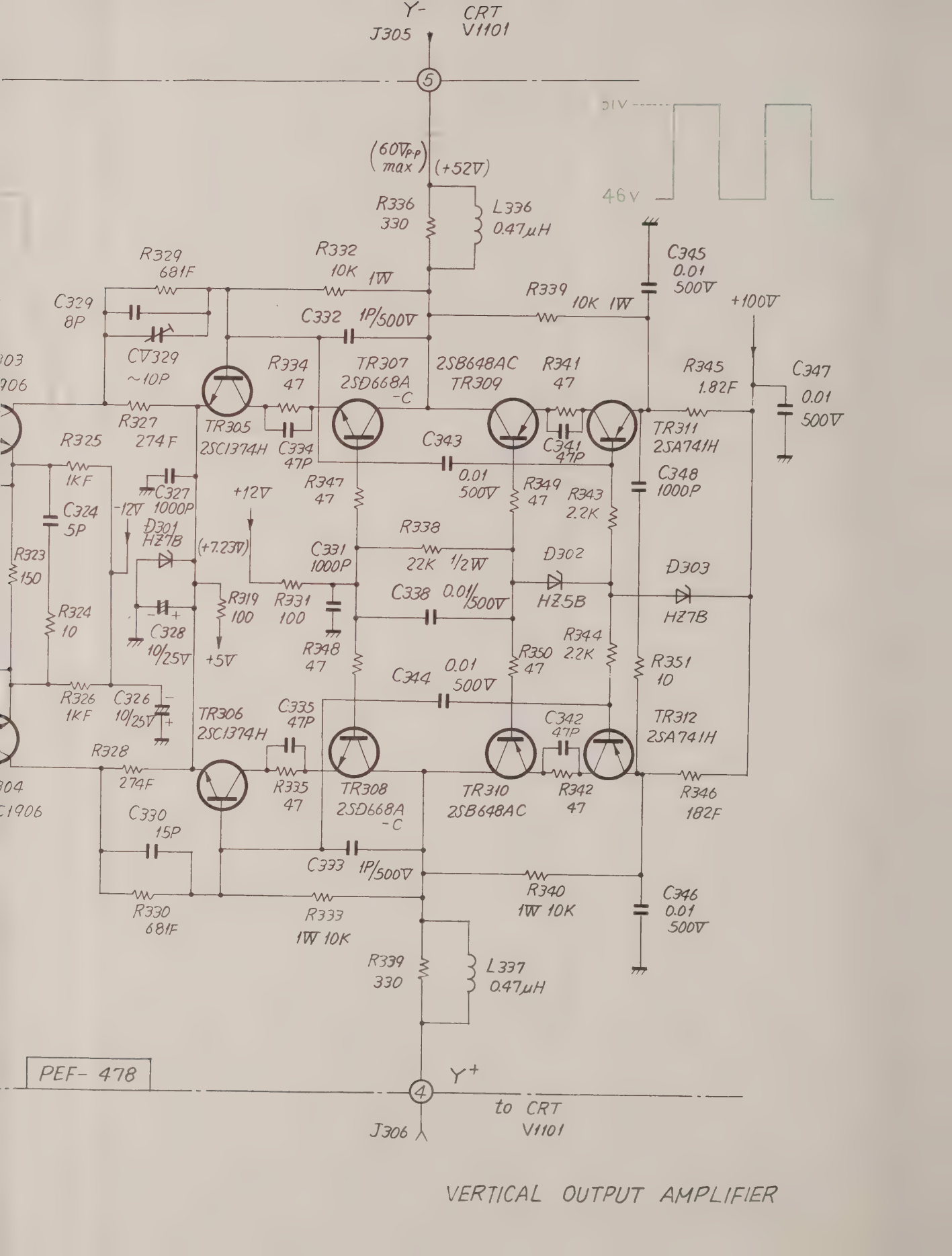

0.15 mA/div
TR
CH1 SIG
TR
TR
CH2 SIG
TR
+2V
+0.36V
D203
D201
D202
D204
D207
D205
D206
D208
A EXT INPUT:0.5V 1KHz
A TRIG SOURCE:EXT
4.0V
0.6V
100mV/div
TR201 2SC535B
C211 1000P
TR203 2SA781K
D211
J203 P203
PEF-476 CH3 SIG
P205
R205 100
R211 680
R213 825F
+5V
D209
R201 33K
R206 1K
R209 3.32KF
+12V
R215 470
R207 619F
C206 2P
R210 3.32KF -12V
0.11V
0.09V
R203 10
R202 100
R214 825F
D210
+12V
C201 10
R204 8.2K
TR202 2SC535B
R212 10
TR204 2SA781K
D212
RV204 10K
-12V
A EXT INPUT:0.5V 1KHz
A TRIG SOURCE:EXT
CH3 CENT
R251 10
R252 10
R253 10
3.0V
0.6V
MODE
CH1
CH2
ALT
CHOP
ADD
S201
-12V
IC 201
74LS109A
G1
D213
D214
D215
D217
D216
S202
RIPL
G1
J201 P201
PEF-477
P510
CHOP CONT
CH SW PULSE
G1
R243 100
0.3V
14mS
V.MODE:ALT
V.MODE:CHOP
2.6V
0V
3.2V
2 μS
* OPEN COLLECTOR

D201 ~ 217 —— 1S2075K

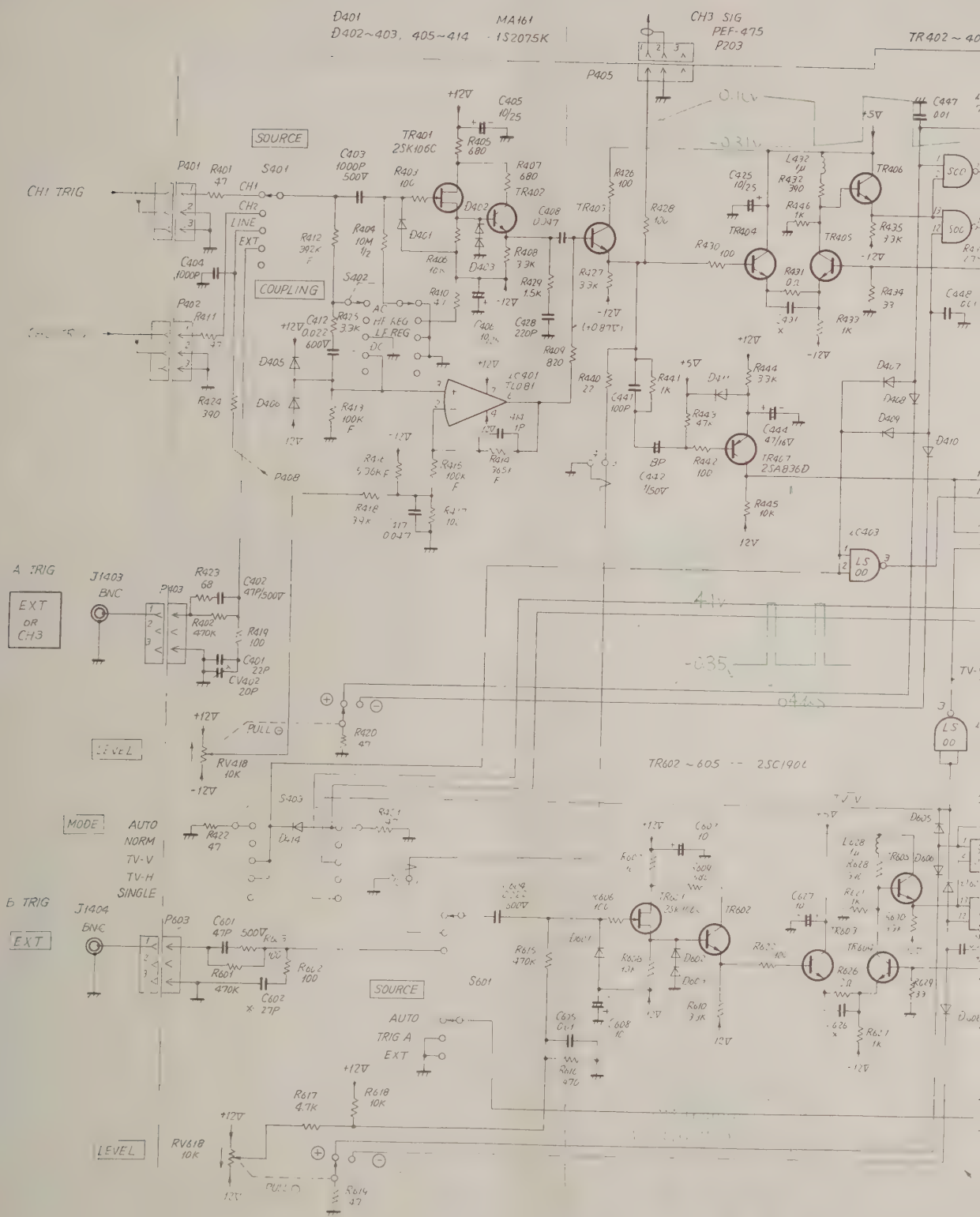


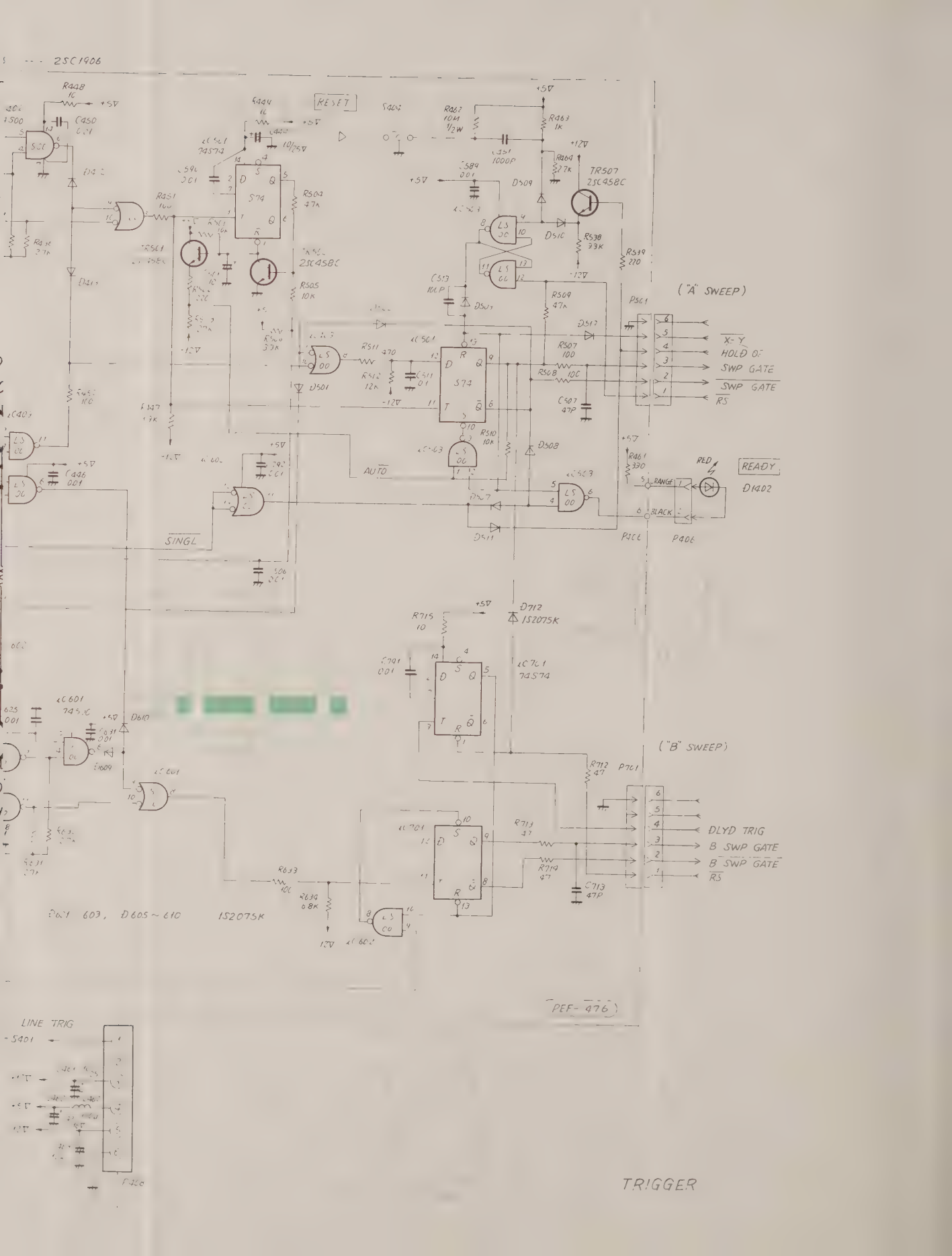
VERTICAL CHANNEL SWITCH

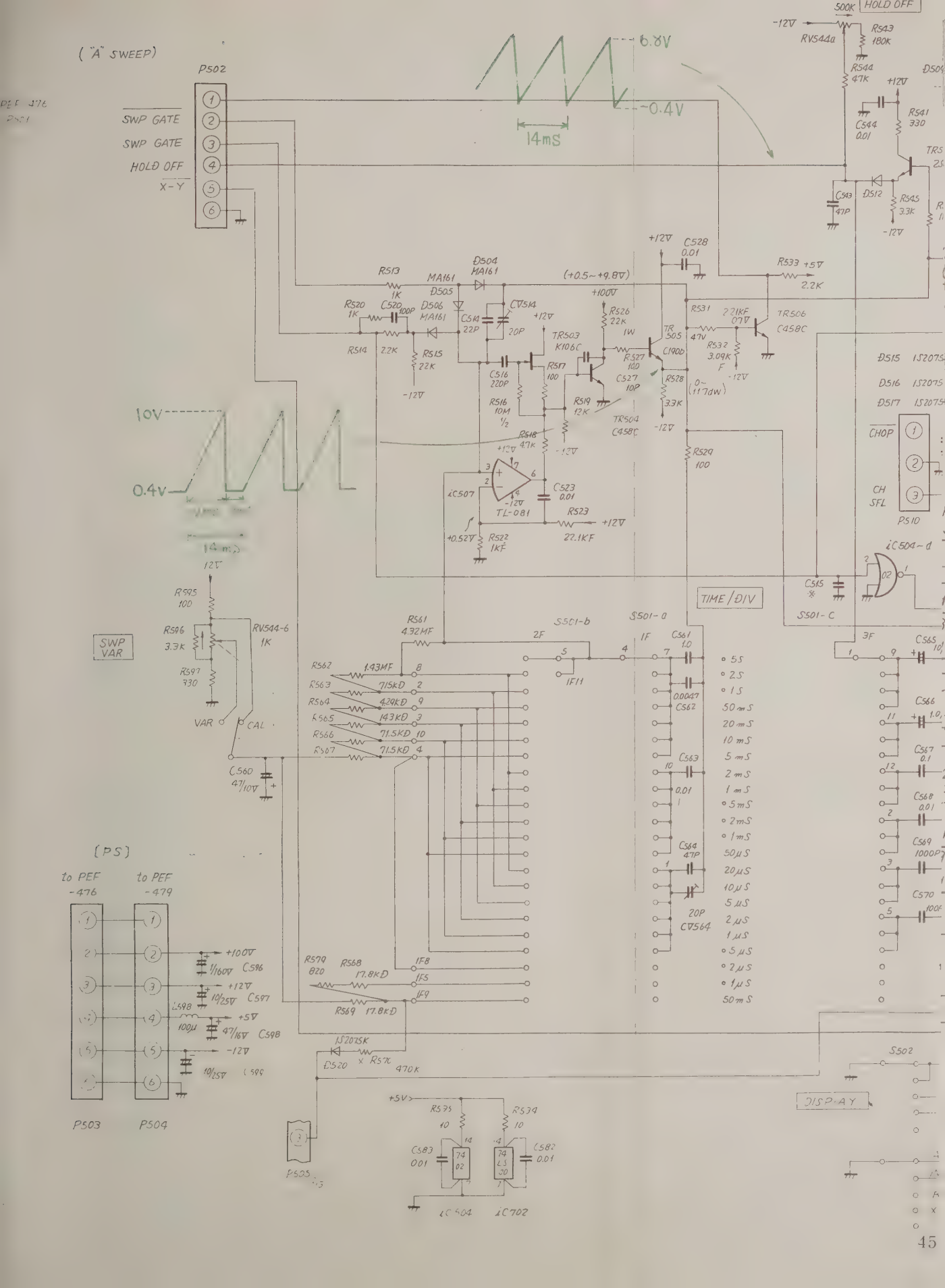

P301
PEF-479
P1101
1
2
3
4
5
6
+100V
+ 12V
+ 5V
- 12V
1.1V
0.7V
4.1V
R309
47
C309
1000P
TR301
2SA781K
R310
150
(+0.85V)
(+4.13V)
+4.88V
(+1.72V)
from
DELAY
LINE
R307
+12V
C304
5P
R301
100F
C305
22P
R306
8.2K
R320
150F
R322
180
R303
4.7K
+5V
C301
10
R304
100
R305
680
C306
3300P
C307
10/25V
CV322
~20P
R302
100F
CV304
~10P
1.21KF
R308
R321
150F
+4.14V
TR302
2SA781K
R312
150
R311
47
C311
1000P
ASTIG
P302
PEF-481
(CRT)
RV1032
200K
R1033
47K
R1032
68K
+100V
GEOM
RV1033
50K
C1034
0.01
500V
R1036
220
R1034
33K
D1032
HZ22
-12V
+12V

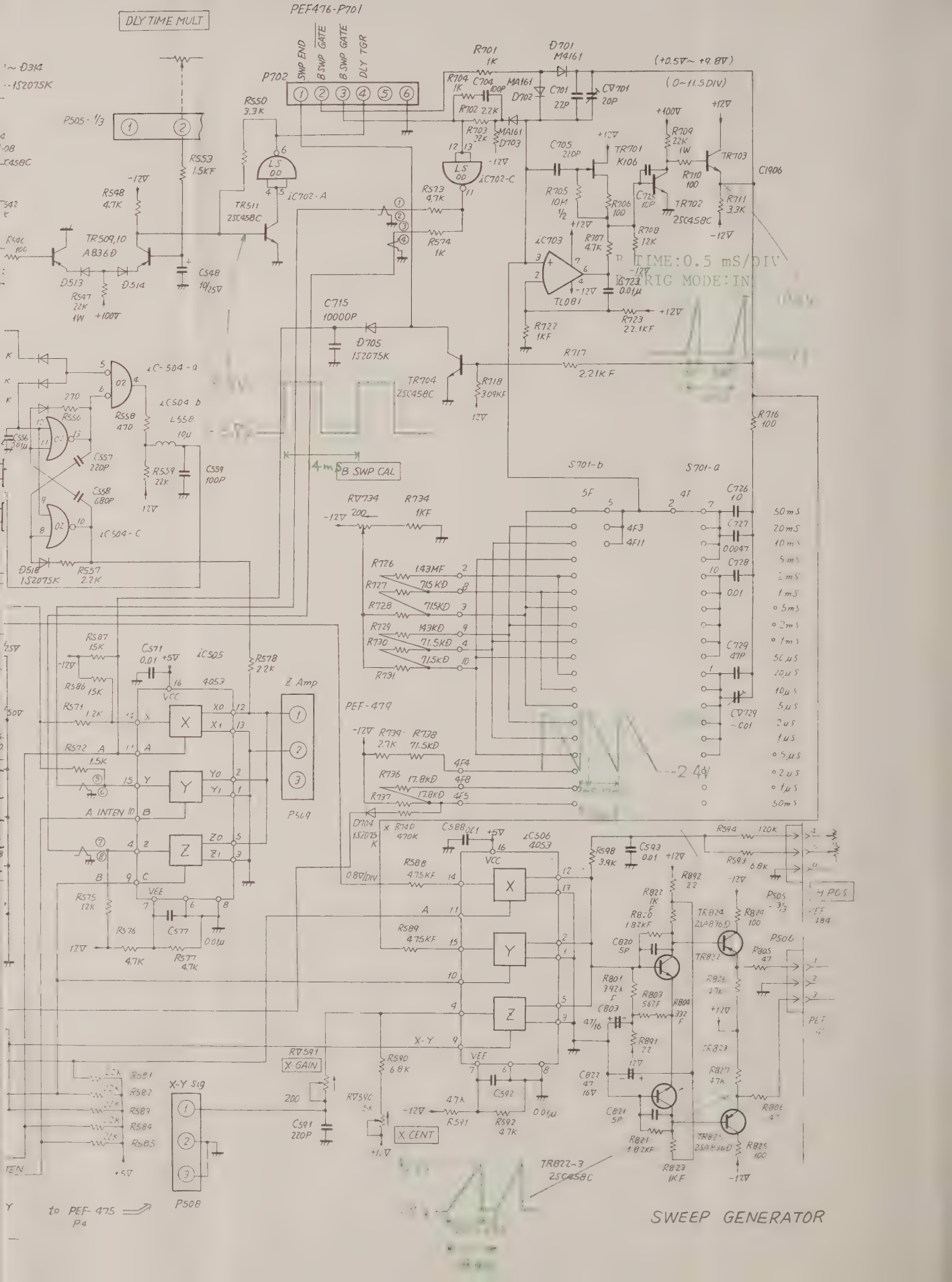


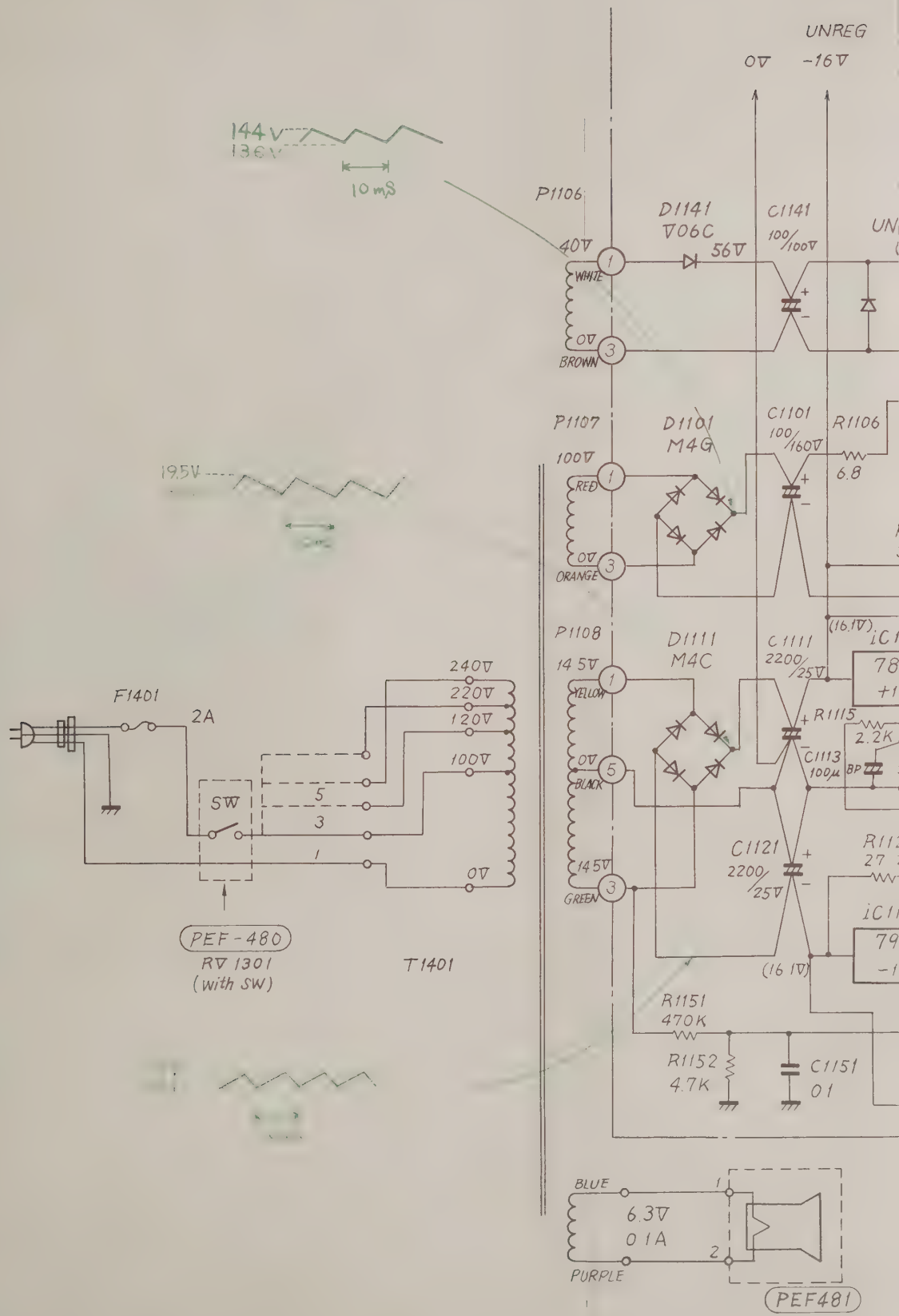
VERTICAL OUTPUT AMPLIFIER

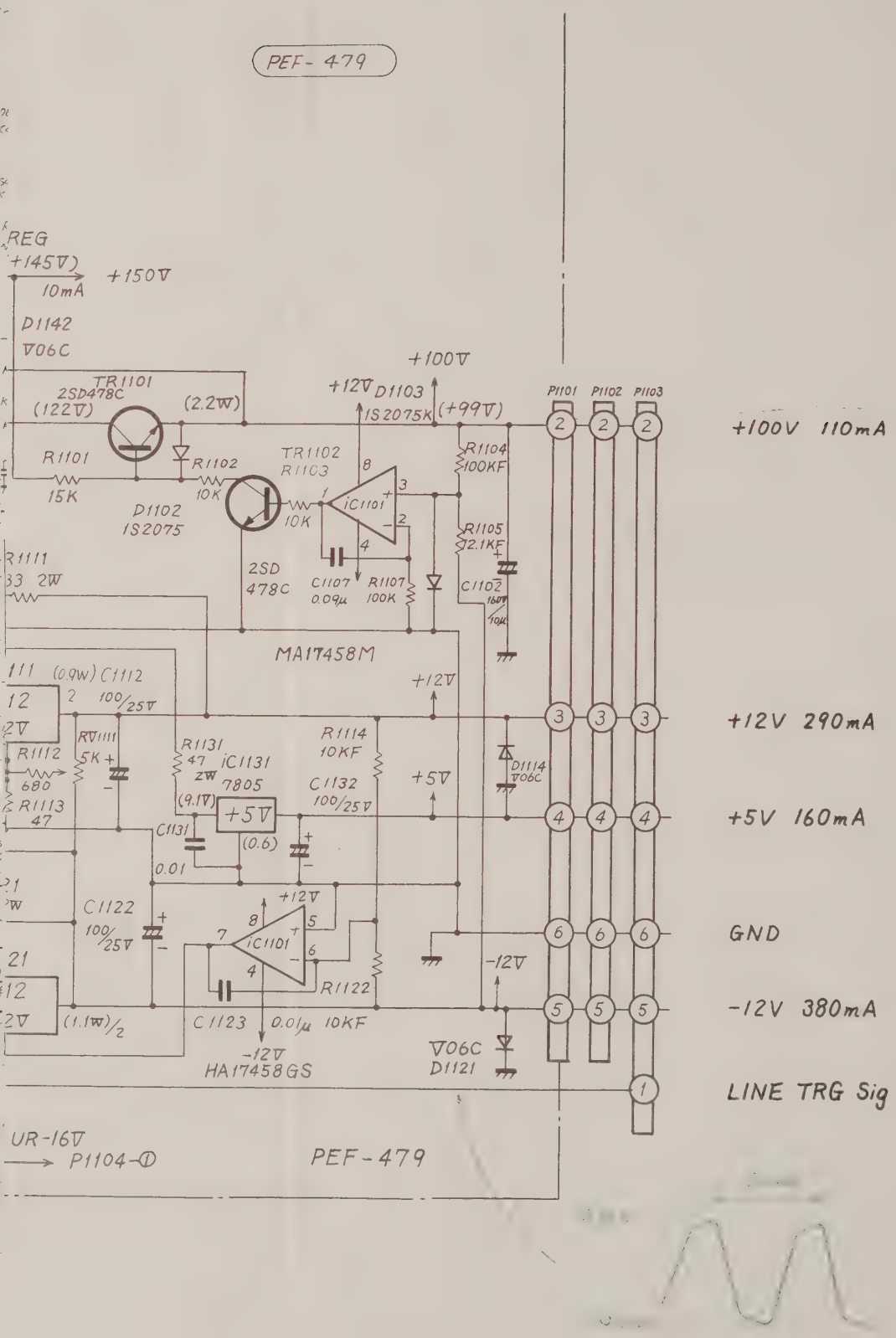

D401
D402~403, 405~414
MA161
1S2075K
CH3 SIG
PEF-475
P203
TR402 ~ 40
P405
+12V
C405
10/25
SOURCE
TR401
2SK106C
R405
680
C403
1000P
500V
R403
100
R407
680
TR402
P401
R401
47
S401
CH1 TRIG
CH1
CH2
LINE
EXT
R412
392K
F
R404
10M
1/2
D401
R406
10K
D403
C408
0.047
TR403
R426
100
C425
10/25
R432
390
TR406
R428
100
TR404
R430
100
TR405
R435
33K
-12V
C404
1000P
COUPLING
S402
AC
HF REG
LF REG
DC
R410
47
C406
10
C428
220P
R429
1.5K
R427
33K
R431
0.2
R439
33
C439
C431
R437
1K
P402
R411
47
C412
0.022
600V
R425
33K
+12V
D405
D406
R424
390
R413
100K
F
R409
820
IC401
TL081
R440
22
C441
100P
R441
1K
D411
R444
33K
D407
D408
D409
D410
R443
47K
C444
47/16V
TR407
2SA836D
R442
100
BP
C442
1/50V
R445
10K
12V
P408
R418
39K
C417
0.047
R417
10K
R416
5.76K F
R415
100K
F
R414
365K
F
1P
A TRIG
J1403
BNC
EXT
OR
CH3
P403
R423
68
C402
47P/500V
R402
470K
R419
100
C401
22P
CV402
20P
+12V
PULL
LEVEL
RV418
10K
-12V
R420
47
TR602 ~ 605 -- 2SC1906
MODE
AUTO
NORM
TV-V
TV-H
SINGLE
S403
R421
R422
47
D414
B TRIG
J1404
BNC
EXT
P603
C601
47P
500V
R601
470K
R602
100
C602
* 27P
SOURCE
S601
AUTO
TRIG A
EXT
+12V
R617
4.7K
R618
10K
LEVEL
RV618
10K
PULL
R614
47
R615
470K
C605
0.01
C606
10
C607
10
C608
10
R606
100
R607
1K
R608
33K
R609
0.22
600V
TR601
2SK106C
TR602
D601
D602
D603
R610
3.3K
12V
C627
10
L628
1u
R628
3.3K
TR603
D605
TR604
R626
2.2
R629
33
R627
100
.626
R621
1K
-12V
D606


2SC1906
RESET
AUTO
SINGL
("A" SWEEP)
X-Y
HOLD OFF
SWP GATE
SWP GATE
RS
RED
READY
RANGE
BLACK
("B" SWEEP)
DLYD TRIG
B SWP GATE
B SWP GATE
RS
D611, 603, D605~610 1S2075K
LINE TRIG
TRIGGER


("A" SWEEP)
P502
SWP GATE
SWP GATE
HOLD OFF
X-Y
6.8V
-0.4V
14mS
HOLD OFF
500K
-12V
RV544a
R543 180K
R544 47K
+12V
R541 330
C544 0.01
D512
R545 3.3K
C543 47P
-12V
+12V
C528 0.01
R533 +5V 2.2K
D504 MA161
D505
R513 1K
(+0.5~+9.8V)
+100V
R520 1K
C520 100P
D506 MA161
C514 22P
CV514 20P
+12V
R514 2.2K
R515 22K
-12V
TR503 K106C
R526 22K 1W
R527 100
R528 33K
TR505 C1906
R531 221KF
R532 3.09K F
TR506 C458C
47V
D515 1S2075
D516 1S2075
D517 1S2075
CHOP
CH SEL
PS10
10V
0.4V
14 m.s
R518 47K
R519 12K
TR504 C458C
R529 100
IC507
TL-081
C523 0.01
R523 22.1KF
+0.52V
R522 1KF
IC504-d
C515
TIME/DIV
S501-C
12V
R595 100
R596 3.3K
R597 330
RV544-6 1K
SWP VAR
VAR
CAL
R561 4.32MF
S501-b
S501-a
2F
1F
1F11
3F
R562 1.43MF
R563 715KΩ
R564 429KΩ
R565 143KΩ
R566 71.5KΩ
R567 71.5KΩ
C560 47/10V
C561 1.0
0.0047 C562
C563 0.01
C564 47P
20P CV564
0.5S
2.5
1.5
50mS
20mS
10mS
5mS
2mS
1mS
0.5mS
0.2mS
0.1mS
50μS
20μS
10μS
5μS
2μS
1μS
0.5μS
0.2μS
0.1μS
50mS
C565 10/
C566 1.0/
C567 0.1
C568 0.01
C569 1000P
C570 100P
[PS]
to PEF -476
to PEF -479
P503
P504
+100V
C596 1/160V
+12V
C597 10/25V
+5V
L598 100μ
C598 47/16V
-12V
C599 10/25V
R579 820
R568 17.8KΩ
R569 17.8KΩ
IF8
IF5
IF9
1S2075K
D520
R571 470K
P505
+5V
R535 10
R534 10
C583 001
C582 0.01
74 02
74 L3 20
IC504
IC702
S502
DISPLAY

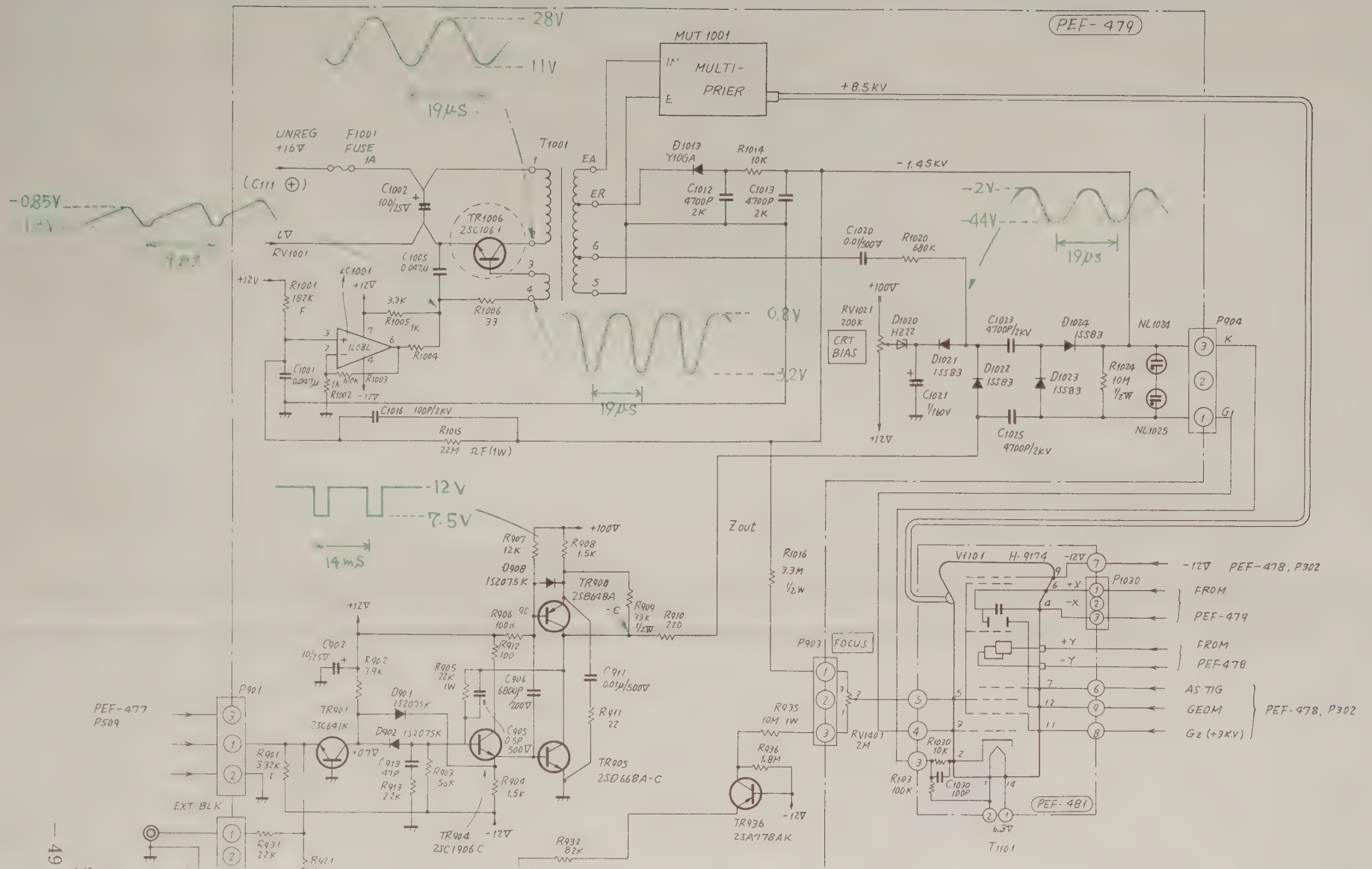

DLY TIME MULT
PEF476-P701
SWP END
B SWP GATE
B SWP GATE
DLY TGR
P702
P505-1/3
R550 3.3K
R553 1.5KF
R548 4.7K
TR509,10 AB36D
TR511 2SC458C
IC702-A
IC702-C
R573 4.7K
R574 1K
D513
D514
C548 10/25V
R547 22K 1W
+100V
-12V
+12V
R701 1K
R704 1K
C704 100P
MA161 D702
R702 2.2K
R703 22K
MA161 D703
D701 M4161
C701 22P
CV701 20P
(+0.5V~+9.8V)
(0~11.5 DIV)
C705 220P
TR701 K106
R705 10M 1/2
R706 100
R707 4.7K
R708 12K
IC703 TL081
C723 0.01μ
R722 1KF
R723 22.1KF
R709 22K 1W
TR703
R710 100
C725 10P
TR702 2SC458C
R711 3.3K
C1906
TIME:0.5 mS/DIV
TRIG MODE:IN
C715 10000P
D705 1S2075K
TR704 2SC458C
R717 2.21K F
R718 309KF
R716 100
IC504-a
IC504-b
IC504-c
R556 270
R558 470
L558 10μ
C556 0.01μ
C557 220P
R559 22K
C559 100P
C558 680P
D518 1S2075K
R557 2.7K
4ms
B SWP CAL
S701-b
S701-a
RV734 200
R734 1KF
R726 1.43MF
R727 715KD
R728 715KD
R729 143KD
R730 71.5KD
R731 71.5KD
C726 10
C727 0.0047
C728 0.01
C729 47P
CV729 ~C01
50mS
20mS
10mS
5mS
2mS
1mS
0.5mS
0.2mS
0.1mS
50μS
20μS
10μS
5μS
2μS
1μS
0.5μS
0.2μS
0.1μS
50mS
4F3
4F11
4F4
4F8
4F5
R739 2.7K
R738 71.5KD
R736 17.8KD
R737 17.8KD
PEF-479
R587 15K
R586 15K
R571 1.2K
R572 1.5K
C571 0.01 +5V
IC505 4053
R578 2.2K
Z Amp
P509
A INTEN
R575 12K
R576 4.7K
C577 0.01μ
R577 4.7K
D704 1S2075K
R740 470K
C588 0.01
IC506 4053
0.8V/DIV
R588 475KF
R589 475KF
C598 3.9K
C593 0.01
R594 120K
R595 6.8K
R892 22
R822 1K F
R826 1.82KF
TR824 2SA836D
R810 100
P505-3/4 HPOS
P506
R805 47
R824 47K
R827 47K
R806 47
R825 100
R823 1KF
TR822-3 2SC458C
R801 392K F
R803 562F
R804 332 F
C803 47/16
C820 SP
C821 SP
C822 47 16V
R891 22
R821 1.82KF
R591 X-GAIN
R590 6.8K
C592 0.01μ
R592 4.7K
R591 47K
X CENT
C591 220P
200
X-Y
X-Y SIG
R581
R582
R583
R584
R585
P508
to PEF-475 P4
SWEEP GENERATOR

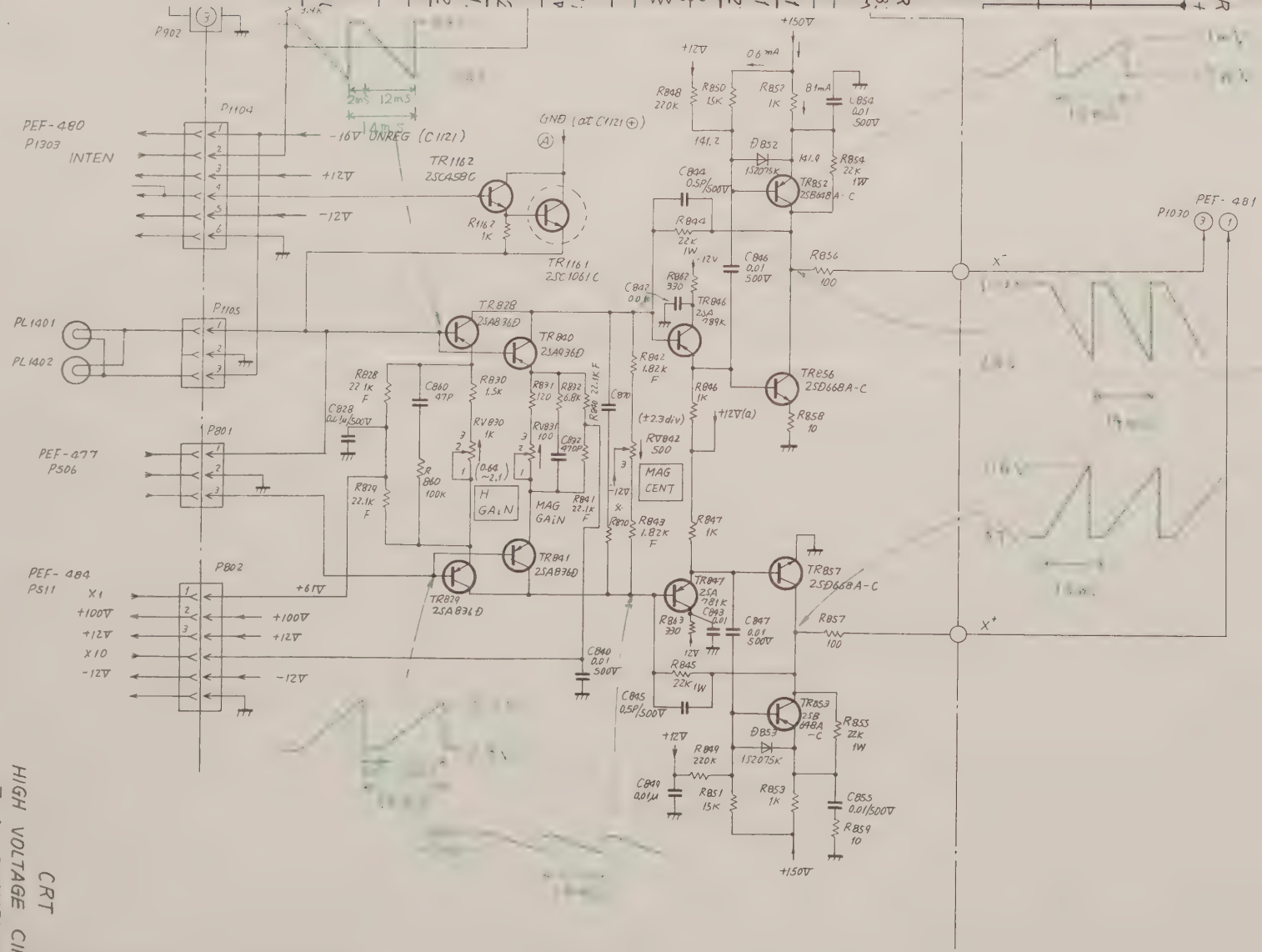

UNREG
0V
-16V
144V
136V
10mS
P1106
D1141
V06C
C1141
100/100V
40V
56V
WHITE
0V
BROWN
P1107
D1101
M4G
C1101
100/160V
R1106
6.8
100V
RED
0V
ORANGE
(16.1V)
P1108
D1111
M4C
C1111
2200/25V
14.5V
YELLOW
R1115
2.2K
C1113
100μ
BP
0V
BLACK
C1121
2200/25V
14.5V
GREEN
(16.1V)
R1151
470K
R1152
4.7K
C1151
.01
F1401
2A
240V
220V
120V
100V
0V
SW
5
3
1
PEF-480
RV 1301
(with SW)
T1401
BLUE
6.3V
0.1A
PURPLE
PEF481

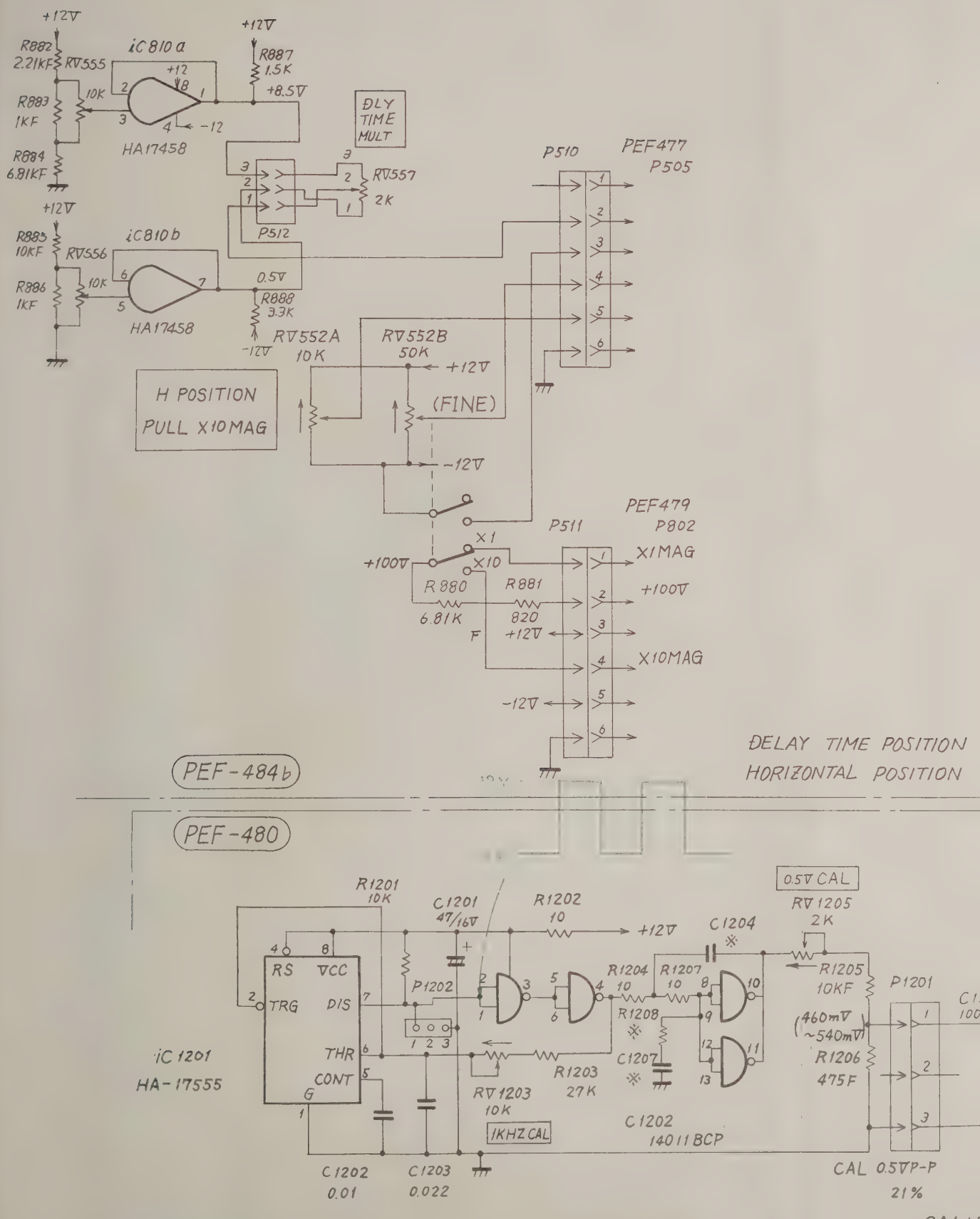


For V-550

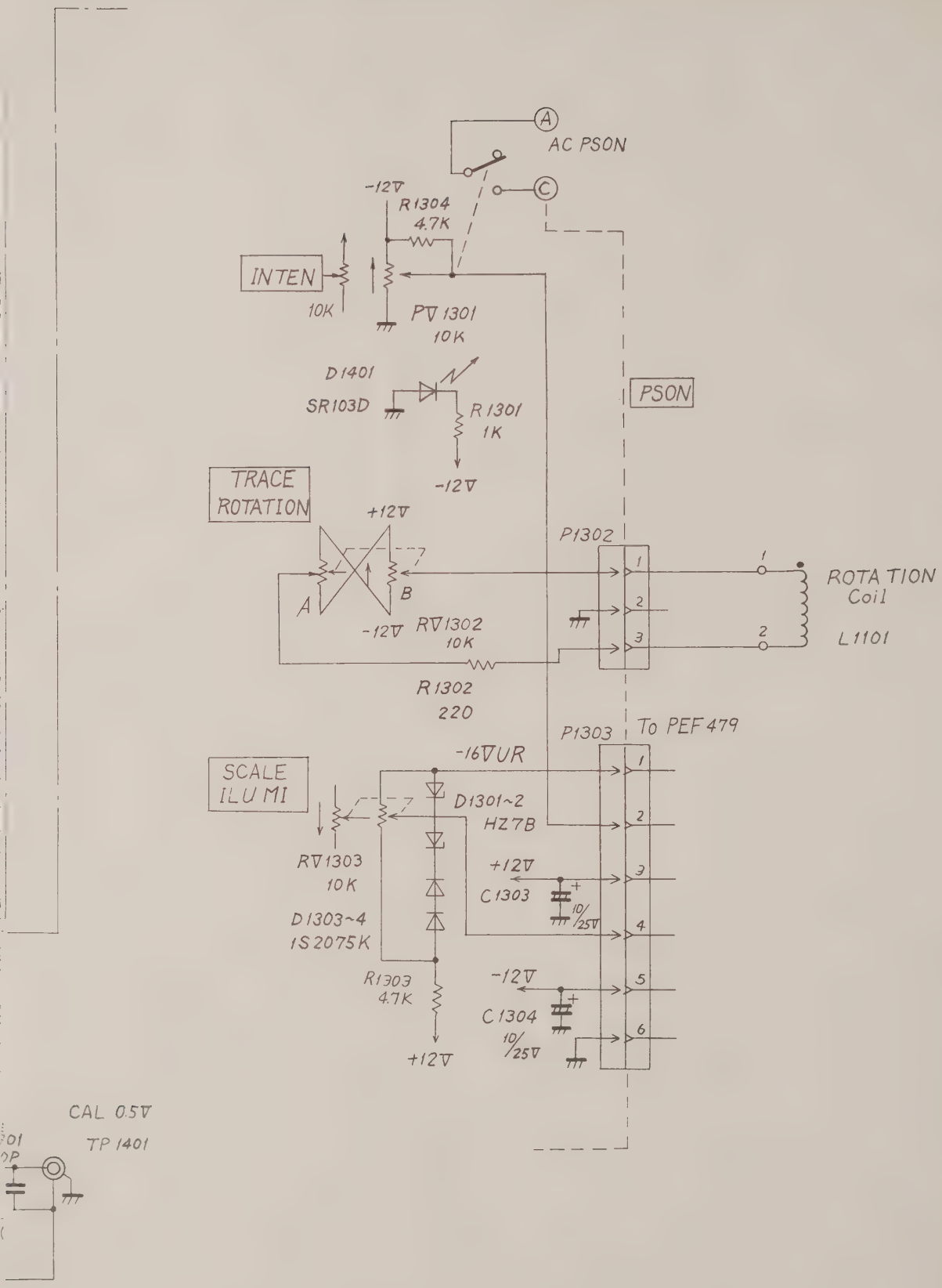
POWER SUPPLY


PEF-479
MUT 1001
MULTI-PRIER
+8.5KV
-1.45KV
28V
11V
19μs
UNREG +16V
F1001 FUSE 1A
T1001
EA
ER
D1013 Y10GA
R1014 10K
C1012 4700P 2K
C1013 4700P 2K
C1002 100/25V
TR1006 2SC1061
C1005 0.047μ
RV1001
LC1001
R1001 182K F
R1005 1K
R1006 33
R1004
R1003
C1001 0.047μ
R1002 -12V
C1016 100P/2KV
R1015 22M ΩF(1W)
-0.85V
-2V
-44V
C1020 0.01/500V
R1020 680K
0.8V
-3.2V
+100V
RV1021 200K
CRT BIAS
D1020 HZ22
D1021 1SS83
D1022 1SS83
D1023 1SS83
D1024 1SS83
C1021 1/160V
C1023 4700P/2KV
C1025 4700P/2KV
R1024 10M 1/2W
NL1024
NL1025
P904
K
G1
-12V
7.5V
14mS
Z out
R1016 3.3M 1/2W
R907 12K
R908 1.5K
D908 1SZ075K
TR908 2SB648A -C
R909 73K 1/2W
R910 220
R906 100K
R912 100
C902 10/25V
R902 7.9K
R905 22K 1W
C906 6800P 200V
C905 0.5P 500V
C911 0.01μ/500V
R911 22
D901 1SZ075K
D902 1SZ075K
TR901 2SC641K
+0.7V
C913 47P
R913 2.2K
R903 50K
R904 1.5K
TR905 2SD668A-C
TR904 2SC1906 C
R932 82K
P901
PEF-477 P509
EXT BLK
R901 3.32K
R931 22K
R921
V1101 H-9174
P1030
FROM PEF-479
FROM PEF-478
AS TIG
GEOM
Gz (+3KV)
PEF-478, P302
P903
FOCUS
R935 10M 1W
RV1401 2M
R936 1.8M
TR936 2SA778AK
R1030 10K
R1031 100K
C1030 100P
PEF-481
6.3V
T1101

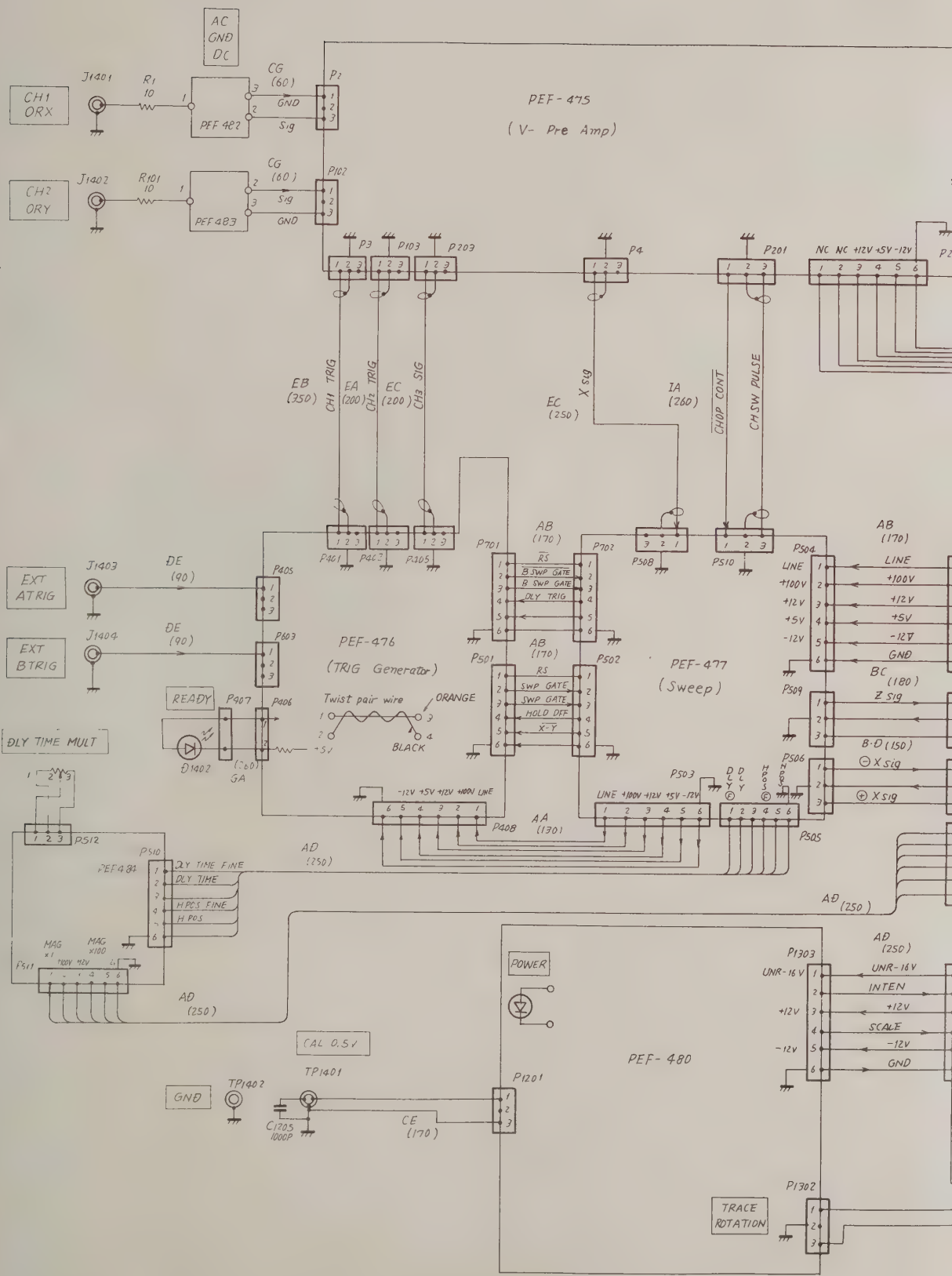

P902
2ms 12mS
P1104
PEF-480
P1303
INTEN
-16V UNREG (C1121)
+12V
-12V
GND (at C1121 ⊖)
TR1162
2SCA58C
R1167
1K
TR1161
2SC1061C
PL1401
PL1402
P1105
TR828
2SA836D
TR840
2SA936D
R828
22.1K F
C828
0.01μ/500V
C860
47P
R830
1.5K
RV830
1K
0.6mA ~2.1
H GAIN
R860
100K
R831
120
R832
6.8K
RV831
100
C832
470P
R841
22.1K F
MAG GAIN
R829
22.1K F
TR841
2SA836D
TR829
2SA836D
P801
PEF-477
P506
PEF-484
P511
P802
X1
+100V
+12V
X10
-12V
+61V
C840
0.01 500V
C870
R842
1.82K F
RV842
500
MAG CENT
R843
1.82K F
R870
R846
1K
(+2.3div)
+12V(a)
R847
1K
TR847
2SA781K
C843
0.01
R843
330
C847
0.01 500V
R845
22K 1W
C845
0.5P/500V
TR853
2SB648A-C
DB853
1S2075K
R855
22K 1W
+12V
R849
220K
C849
0.01μ
R851
15K
R853
1K
C855
0.01/500V
R859
10
+150V
R848
220K
R850
15K
R852
1K
0.1mA
C852
0.01 500V
141.2
DB852
1S2075K
R854
22K 1W
TR852
2SB648A-C
C844
0.5P/500V
R844
22K 1W
C846
0.01 500V
R856
100
R862
330
C842
0.01
TR846
2SA789K
TR856
2SD668A-C
R858
10
TR857
2SD668A-C
R857
100
X-
X+
PEF-481
P1030
CRT
HIGH VOLTAGE CIRCUIT
Z AXIS AMPLIFIER
HORIZONTAL AMPLIFIER

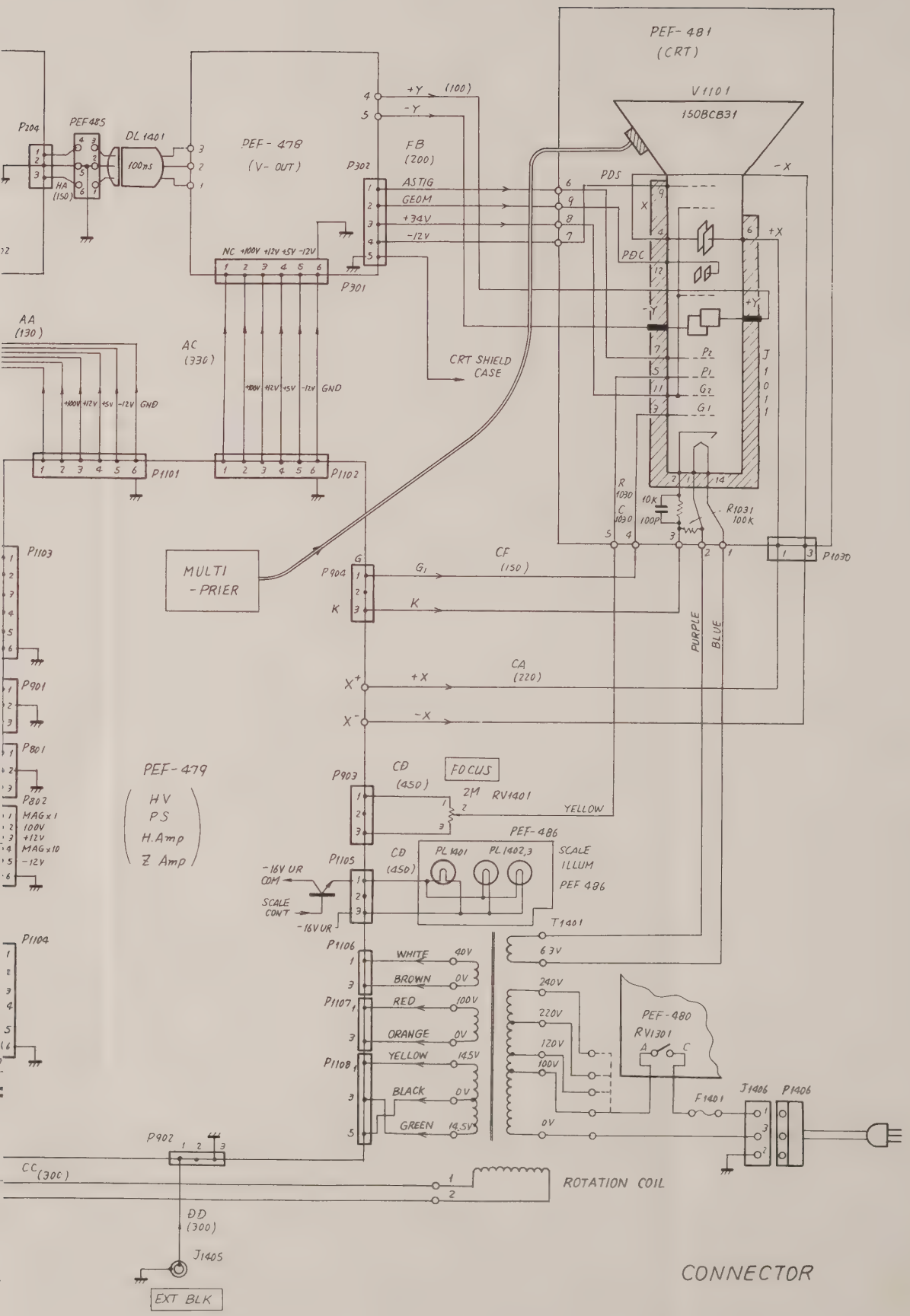

+12V
R882 2.21KF
RV555
R883 1KF
10K
R884 6.81KF
iC 810 a
HA17458
R887 1.5K
+8.5V
-12
DLY TIME MULT
RV557 2K
P512
P510
PEF477 P505
iC 810 b
RV556
R885 10KF
R886 1KF
R888 3.3K
0.5V
-12V
RV552A 10K
RV552B 50K
(FINE)
H POSITION PULL X10 MAG
PEF479 P802
P511
X1
X10
+100V
R880 6.81K
R881 820
F
X1MAG
X10MAG
PEF-484b
DELAY TIME POSITION
HORIZONTAL POSITION
PEF-480
R1201 10K
C1201 47/16V
R1202 10
0.5V CAL
RV1205 2K
C1204
R1204 10
R1207 10
R1205 10KF
P1201
R1208
C1207
(460mV ~540mV)
R1206 475F
iC 1201 HA-17555
RS
VCC
TRG
DIS
THR
CONT
G
P1202
RV1203 10K
R1203 27K
1KHZ CAL
C1202 14011BCP
C1202 0.01
C1203 0.022
CAL 0.5VP-P 21%

CALIB



INTENSITY
TRACE ROTATION
SCALE ILUMINATION


PEF-475
(V- Pre Amp)
CH1 ORX
CH2 ORY
PEF 482
PEF 483
AC GND DC
CG (60)
GND
Sig
R1 10
R101 10
J1401
J1402
P2
P102
P3
P103
P203
P4
P201
NC NC +12V +5V -12V
EB (350)
CH1 TRIG
EA (200)
CH2 TRIG
EC (200)
CH3 SIG
EC (250)
X Sig
IA (260)
CHOP CONT
CH.SW PULSE
P401
P402
P305
P508
P510
P504
P701
P703
P501
P502
AB (170)
RS
B SWP GATE
A SWP GATE
DLY TRIG
SWP GATE
HOLD OFF
X-Y
LINE
+100V
+12V
+5V
-12V
GND
EXT ATRIG
EXT BTRIG
J1403
J1404
DE (90)
P405
P403
PEF-476
(TRIG Generator)
PEF-477
(Sweep)
READY
P407
P406
D1402
(260) GA
Twist pair wire
ORANGE
BLACK
+5V
DLY TIME MULT
P512
P510
PEF 484
DLY TIME FINE
DLY TIME
H POS FINE
H POS
MAG x1
MAG x100
P511
AD (250)
-12V +5V +12V +100V LINE
LINE +100V +12V +5V -12V
P408
AA (130)
P503
P505
P506
BC (180)
Z Sig
B-D (150)
⊖ X sig
⊕ X sig
CAL 0.5V
GND
TP1402
TP1401
C1205 1000P
CE (170)
POWER
PEF-480
P1303
P1201
P1302
UNR-16V
INTEN
SCALE
TRACE ROTATION


PEF-481
(CRT)
V1101
150BCB31
PEF-485
DL1401
100ns
HA
(150)
P204
PEF-478
(V-OUT)
FB
(200)
P302
+Y
-Y
(100)
ASTIG
GEOM
+34V
-12V
NC +100V +12V +5V -12V
P301
PDS
PDC
-X
+X
+Y
-Y
Pz
Pl
G2
G1
J1011
CRT SHIELD CASE
AA
(130)
AC
(330)
+100V +12V +5V -12V GND
P1101
P1102
R1030
C1030
10K
100P
R1031
100K
P1030
P1103
MULTI-PRIER
P904
G
K
G1
CF
(150)
PURPLE
BLUE
P901
X+
X-
+X
-X
CA
(220)
P801
P802
MAG x1
100V
+12V
MAG x10
-12V
PEF-479
HV
PS
H.Amp
Z Amp
P903
CD
(450)
FOCUS
2M RV1401
YELLOW
PEF-486
PL1401
PL1402,3
SCALE ILLUM
PEF 486
P1105
-16V UR COM
SCALE CONT
-16V UR
T1401
63V
240V
220V
120V
100V
0V
P1106
WHITE 40V
BROWN 0V
P1107
RED 100V
ORANGE 0V
P1108
YELLOW 14.5V
BLACK 0V
GREEN 14.5V
PEF-480
RV1301
A
C
F1401
J1406
P1406
P1104
P902
CC (300)
ROTATION COIL
DD
(300)
J1405
EXT BLK

CONNECTOR

ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-475)

Symbol	Description					Code	Qty
C3	C,CERAMIC	50	V	47	PF+-5%	CCC1014	1
C9	C,CERAMIC	50	V	68	PF+-5%	CCC1034	1
C11	C,CERAMIC	500	V	5	PF+-0.5PF	CCC0769	1
C12	C,CERAMIC	500	V	10	PF+-10%	CCC0772	1
C13	C,CERAMIC	50	V	5	PF+-0.25PF	CCC0999	1
C14	C,CERAMIC	50	V	220	PF+-10%	CCC1027	1
C15	C,CERAMIC	50	V	100	PF+-10%	CCC1025	1
C18	C,CERAMIC	50	V	10000	PF+80%-20	CCC1030	1
C19	C,CERAMIC	50	V	10000	PF+80%-20%	CCC1030	1
C16	C,CERAMIC	50	V	22	PF+-5%	CCC1007	1
C23	C,CERAMIC	500	V	1000	PF+-10%	CCD0217	1
C24	C,CERAMIC	50	V	100	PF+-10%	CCC1025	1
C27	C,PLASTIC	50	V	1000	PF+-10%	CQA0091	1
C29	C,CERAMIC	50	V	1000	PF+80%-20%	CCC1029	1
C31	C,AL ELYC	25	V	10	UF	CEC0175	1
C32	C,CERAMIC	50	V	1000	PF+80%-20%	CCC1029	1
C37	C,CERAMIC	50	V	1	PF+-0.25PF	CCC1133	1
C41	C,AL ELYC	25	V	10	UF	CEC0175	1
C43	C,AL ELYC	25	V	10	UF	CEC0175	1
C51	C,CERAMIC	50	V	10	PF+-0.5PF	CCC1002	1
C52	C,CERAMIC	50	V	10	PF+-0.5PF	CCC1002	1
C56	C,CERAMIC	50	V	22	PF+-5%	CCC1007	1
C67	C,CERAMIC	50	V	15	PF+-5%	CCC1004	1
C68	C,CERAMIC	50	V	2	PF+-0.25PF	CCC0996	1
C70	C,AL ELYC	25	V	10	UF	CEC0175	1
C71	C,CERAMIC	50	V	10000	PF+80%-20%	CCC1030	1
C72	C,AL ELYC	25	V	10	UF	CEC0175	1
C77	C,CERAMIC	50	V	22	PF+-5%	CCC1007	1
C82	C,CERAMIC	50	V	15	PF+-5%	CCC1004	1
C87	C,PLASTIC	50	V	1000	PF+-10%	CQA0091	1

Symbol	Description	Code	Qty
C89	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1
C92	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C93	C,CERAMIC 50 V 3 PF+-0.25PF	CCC0997	1
C96	C,PLASTIC 50 V 0.047 UF	CQA0101	1
C98	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
CV6	C,VALIABLE ECV-1ZW10 ×40	CVE0024	1
CV7	C,VALIABLE ECV-1ZW10 ×40	CVE0024	1
CV11	C,VALIABLE ECV-1ZW10 ×40	CVE0024	1
CV12	C,VALIABLE ECV-1ZW10 ×40	CVE0024	1
CV22	C,VALIABLE ECV-1ZW10 ×40	CVE0024	1
D1	DIODE 1S2075K	HDS0108	1
D2	DIODE HZ7B	HDH0040	1
D3	DIODE HZ7B	HDH0040	1
D4	DIODE 1S2075K	HDS0108	1
IC1	IC,ANALOG TL071CP	ILT0041	1
TR1	TRANSISTOR 2SK106C	HTK0068	1
TR2	TRANSISTOR 2SC458C	HTC0148	1
TR3	TRANSISTOR 2SC1674K	HTC0557	1
TR4	TRANSISTOR 2SA781K	HTA0099	1
TR5	TRANSISTOR 2SC535B	HTC0167	1
TR6	TRANSISTOR 2SC535B	HTC0167	1
TR7	TRANSISTOR 2SA781K	HTA0099	1
TR8	TRANSISTOR 2SA781K	HTA0099	1
TR15	TRANSISTOR 2SA781K	HTA0099	1
TR16	TRANSISTOR 2SC535B	HTC0167	1
TR17	TRANSISTOR 2SA781K	HTA0099	1
R3	R,CARBON 1/4W 22 OHM +-5%	RCR3012	1
R4	R,CARBON 1/4W 15 OHM +-5%	RCR3008	1
R5	R,CARBON 1/4W 10 OHM +-5%	RCR3004	1
R6	R,CARBON 1/4W 68 OHM +-5%	RCR3024	1

Symbol	Description				Code	Qty
R7	R,METAL	1/2W	900	KOHM +-0.5%	RMR0261	1
R8	R,METAL	1/4W	111	KOHM +-0.5%	RME0694	1
R9	R,CARBON	1/4W	39	OHM +-5%	RCR3018	1
R10	R,CARBON	1/4W	82	OHM +-5%	RCR3026	1
R11	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R12	R,METAL	1/2W	990	KOHM +-0.5%	RMR0264	1
R13	R,METAL	1/4W	10.1	KOHM +-0.5%	RME0695	1
R14	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R15	R,CARBON	1/4W	220	OHM +-5%	RCR3036	1
R16	R,CARBON	1/4W	47	OHM + 5%	RCR3020	1
R17	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R18	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R19	R,METAL	1/4W	4.75	KOHM +-1%	RME0672	1
R20	R,METAL	1/2W	800	KOHM +-0.5%	RMR0259	1
R21	R,METAL	1/4W	200	KOHM +-0.5%	RME0702	1
R22	R,CARBON	1/4W	470	OHM +-5%	RCR3044	1
R23	R,SOLID	1/2W	10	MOHM +-5%	RSE0311	1
R24	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R25	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R26	R,CARBON	1/4W	220	OHM +-5%	RCR3036	1
R27	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R28	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R29	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R30	R,CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R31	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R32	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R33	R,CARBON	1/4W	1.5	KOHM +-5%	RCR3056	1
R34	R,METAL	1/4W	45.3	OHM +-0.5%	RME0766	1
R35	R,METAL	1/4W	365	OHM +-1%	RME0705	1
R36	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1

Symbol	Description			Code	Qty
R37	R,METAL	1/4W	475 OHM +-0.5%	RME0703	1
R38	R,METAL	1/4W	46.0 KOHM +-0.5%	RME0706	1
R39	R,METAL	1/4W	200 KOHM +-0.5%	RME0702	1
R40	R,METAL	1/4W	4.00 KOHM +-0.5%	RME0707	1
R41	R,CARBON	1/4W	22 OHM +-5%	RCR3012	1
R42	R,CARBON	1/4W	1.0 KOHM +-5%	RCR3052	1
R43	R,CARBON	1/4W	22 OHM +-5%	RCR3012	1
R44	R,CARBON	1/4W	10 OHM +-5%	RCR3004	1
R47	R,CARBON	1/4W	100 KOHM +-5%	RCR3100	1
R49	R,CARBON	1/4W	220 OHM +-5%	RCR3036	1
R50	R,CARBON	1/4W	220 OHM +-5%	RCR3036	1
R51	R,CARBON	1/4W	270 OHM +-5%	RCR3038	1
R52	R,CARBON	1/4W	1.0 KOHM +-5%	RCR3052	1
R53	R,METAL	1/4W	300 OHM +-0.5%	RME0708	1
R54	R,METAL	1/4W	150 OHM +-0.5%	RME0709	1
R55	R,METAL	1/4W	90.0 OHM +-0.5%	RME0710	1
R56	R,METAL	1/4W	60.0 OHM +-0.5%	RME0711	1
R57	R,CARBON	1/4W	150 OHM +-5%	RCR3032	1
R58	R,CARBON	1/4W	39 OHM +-5%	RCR3018	1
R59	R,CARBON	1/4W	100 OHM +-5%	RCR3028	1
R61	R,CARBON	1/4W	150 OHM +-5%	RCR3032	1
R62	R,CARBON	1/4W	4.7 KOHM +-5%	RCR3068	1
R63	R,CARBON	1/4W	100 OHM +-5%	RCR3028	1
R64	R,CARBON	1/4W	2.7 KOHM +-5%	RCR3062	1
R65	R,CARBON	1/4W	4.7 KOHM +-5%	RCR3068	1
R66	R,METAL	1/4W	100 OHM +-1%	RME0652	1
R67	R,CARBON	1/4W	1.5 KOHM +-5%	RCR3056	1
R68	R,METAL	1/4W	825 OHM +-1%	RME0663	1
R69	R,CARBON	1/4W	1.5 KOHM +-5%	RCR3056	1
R70	R,CARBON	1/4W	10 OHM +-5%	RCR3004	1

Symbol	Description				Code	Qty
R71	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R72	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R73	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R74	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R75	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R76	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R77	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R80	R,CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R81	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R82	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R83	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R84	R,CARBON	1/4W	68	OHM +-5%	RCR3024	1
R85	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R86	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R87	R,CARBON	1/4W	680	OHM +-5%	RCR3048	1
R88	R,CARBON	1/4W	680	OHM +-5%	RCR3048	1
R89	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R90	R,METAL	1/4W	825	OHM +-1%	RME0663	1
R91	R,METAL	1/4W	825	OHM +-1%	RME0663	1
R92	R,CARBON	1/4W	470	OHM +-5%	RCR3044	1
R96	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R97	R,CARBON	1/4W	15	KOHM +-5%	RCR3080	1
R98	R,CARBON	1/4W	5.6	KOHM +-5%	RCR3070	1
RV27	VR,METAL	TM8KH1-7E1		10K OHM	RNT0181	1
RV33	VR,METAL	TM8KH1-7E1		2K OHM	RNT0182	1
RV51	SW,ROTARY	S21P 3310 (WITH VR)			HX3142079	R
RV64	VR,METAL	TM8KH1-7E1		2K OHM	RNT0182	1
RV84	VR,METAL	TM8KH1-7E1		200 OHM	RNT0183	1
RV97	VR,METAL	TM8KH1-7E1		50K OHM	RNT0184	1
RV98	VR,CARBON	EVH-YK3325B14			RDE0003	1

Symbol	Description	Code	Qty
L34	COIL FL-3H R47M	TLF0052	1
L74	COIL FL-3H 100K	TLF0028	1
P2	CONNECTOR 171825-3	JBX0468	1
P3	CONNECTOR 171825-3	JBX0468	1
P4	CONNECTOR 171825-3	JBX0468	1
S2	SW,ROTARY S21P 3310 (WITH VR)	HX3142079	1
C103	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C109	C,CERAMIC 50 V 68 PF+-5%	CCC1034	1
C111	C,CERAMIC 500 V 5 PF+-0.5PF	CCC0769	1
C112	C,CERAMIC 500 V 10 PF+-10%	CCC0772	1
C113	C,CERAMIC 50 V 5 PF+-0.25PF	CCC0999	1
C114	C,CERAMIC 50 V 220 PF+-10%	CCC1027	1
C115	C,CERAMIC 50 V 100 PF+-10%	CCC1025	1
C118	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C119	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C116	C,CERAMIC 50 V 22 PF+-5%	CCC1007	1
C123	C,CERAMIC 500 V 1000 PF+-10%	CCD0217	1
C124	C,CERAMIC 50 V 100 PF+-10%	CCC1025	1
C127	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1
C129	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C131	C,AL ELYC 25 V 10 UF	CEC0175	1
C132	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C137	C,CERAMIC 50 V 1 PF+-0.25PF	CCC1133	1
C141	C,AL ELYC 25 V 10 UF	CEC0175	1
C142	C,AL ELYC 25 V 10 UF	CEC0175	1
C143	C,AL ELYC 25 V 10 UF	CEC0175	1
C151	C,CERAMIC 50 V 10 PF+-0.5PF	CCC1002	1
C152	C,CERAMIC 50 V 10 PF+-0.5PF	CCC1002	1
C156	C,CERAMIC 50 V 22 PF+-5%	CCC1007	1
C167	C,CERAMIC 50 V 22 PF+-5%	CCC1007	1

Symbol	Description	Code	Qty
C168	C,CERAMIC 50 V 2 PF+-0.25PF	CCC0996	1
C170	C,AL ELYC 25 V 10 UF	CEC0175	1
C171	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C172	C,AL ELYC 25 V 10 UF	CEC0175	1
C173	C,AL ELYC 25 V 10 UF	CEC0175	1
C187	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1
C189	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1
C192	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C193	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C196	C,PLASTIC 50 V 47000 PF+-10%	CQA0101	1
C198	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
CV106	C,VALIABLE ECV-1ZW10 ×40	CVE0024	1
CV107	C,VALIABLE ECV-1ZW10 ×40	CVE0024	1
CV111	C,VALIABLE ECV-1ZW10 ×40	CVE0024	1
CV112	C,VALIABLE ECV-1ZW10 ×40	CVE0024	1
CV122	C,VALIABLE ECV-1ZW10 ×40	CVE0024	1
CV182	C,VARIABLE ECV-1ZW20 ×40	CVE0019	1
D101	DIODE 1S2075K	HDS0108	1
D102	DIODE HZ7B	HDH0040	1
D103	DIODE HZ7B	HDH0040	1
D104	DIODE 1S2075K	HDS0108	1
IC101	IC,ANALOG TL071CP	ILT0041	1
TR101	TRANSISTOR 2SK106C	HTK0068	1
TR102	TRANSISTOR 2SC458C	HTC0148	1
TR103	TRANSISTOR 2SC1674K	HTC0557	1
TR104	TRANSISTOR 2SA781K	HTA0099	1
TR105	TRANSISTOR 2SC535B	HTC0167	1
TR106	TRANSISTOR 2SC535B	HTC0167	1
TR107	TRANSISTOR 2SA781K	HTA0099	1
TR108	TRANSISTOR 2SA781K	HTA0099	1

Symbol	Description			Code	Qty
TR109	TRANSISTOR	2SA781K		HTA0099	1
TR110	TRANSISTOR	2SA781K		HTA0099	1
TR115	TRANSISTOR	2SA781K		HTA0099	1
TR116	TRANSISTOR	2SC535B		HTC0167	1
TR117	TRANSISTOR	2SA781K		HTA0099	1
R103	R,CARBON	1/4W	22 OHM +-5%	RCR3012	1
R104	R,CARBON	1/4W	47 OHM +-5%	RCR3020	1
R105	R,CARBON	1/4W	10 OHM +-5%	RCR3004	1
R106	R,CARBON	1/4W	68 OHM +-5%	RCR3024	1
R107	R,METAL	1/2W	900 KOHM +-0.5%	RMR0261	1
R108	R,METAL	1/4W	111 KOHM +-0.5%	RME0694	1
R109	R,CARBON	1/4W	39 OHM +-5%	RCR3018	1
R110	R,CARBON	1/4W	82 OHM +-5%	RCR3026	1
R111	R,CARBON	1/4W	100 OHM +-5%	RCR3028	1
R112	R,METAL	1/2W	990 KOHM +-0.5%	RMR0264	1
R113	R,METAL	1/4W	10.1 KOHM +-0.5%	RME0695	1
R114	R,CARBON	1/4W	15 OHM +-5%	RCR3008	1
R115	R,CARBON	1/4W	150 OHM +-5%	RCR3032	1
R116	R,CARBON	1/4W	47 OHM +-5%	RCR3020	1
R117	R,CARBON	1/4W	100 OHM +-5%	RCR3028	1
R118	R,CARBON	1/4W	100 OHM +-5%	RCR3028	1
R119	R,METAL	1/4W	4.75 KOHM +-1%	RME0672	1
R120	R,METAL	1/2W	800 KOHM +-0.5%	RMR0259	1
R121	R,METAL	1/4W	200 KOHM +-0.5%	RME0702	1
R122	R,CARBON	1/4W	470 OHM +-5%	RCR3044	1
R123	R,SOLID	1/2W	10 MOHM +-5%	RSE0311	1
R124	R,CARBON	1/4W	47 OHM +-5%	RCR3020	1
R125	R,CARBON	1/4W	47 OHM +-5%	RCR3020	1
R126	R,CARBON	1/4W	220 OHM +-5%	RCR3036	1
R127	R,CARBON	1/4W	3.3 KOHM +-5%	RCR3064	1

Symbol	Description				Code	Qty
R128	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R129	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R130	R,CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R131	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R132	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R133	R,CARBON	1/4W	1.5	KOHM +-5%	RCR3056	1
R134	R,METAL	1/4W	45.3	OHM +-0.5%	RME0766	1
R135	R,METAL	1/4W	365	OHM +-1%	RME0705	1
R136	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R137	R,METAL	1/4W	475	OHM +-0.5%	RME0703	1
R138	R,METAL	1/4W	46.0	KOHM +-0.5%	RME0706	1
R139	R,METAL	1/4W	200	KOHM +-0.5%	RME0702	1
R140	R,METAL	1/4W	4.00	KOHM +-0.5%	RME0707	1
R141	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R142	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R143	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R144	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R147	R,CARBON	1/4W	100	KOHM +-5%	RCR3100	1
R149	R,CARBON	1/4W	220	OHM +-5%	RCR3036	1
R150	R,CARBON	1/4W	220	OHM +-5%	RCR3036	1
R151	R,CARBON	1/4W	270	OHM +-5%	RCR3038	1
R152	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R153	R,METAL	1/4W	300	OHM +-0.5%	RME0708	1
R154	R,METAL	1/4W	150	OHM +-0.5%	RME0709	1
R155	R,METAL	1/4W	90.0	OHM +-0.5%	RME0710	1
R156	R,METAL	1/4W	60.0	OHM +-0.5%	RME0711	1
R157	R,CARBON	1/4W	150	OHM +-5%	RCR3032	1
R158	R,CARBON	1/4W	39	OHM +-5%	RCR3018	1
R159	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R161	R,CARBON	1/4W	150	OHM +-5%	RCR3032	1

Symbol	Description				Code	Qty
R162	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R163	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R164	R,CARBON	1/4W	2.7	KOHM +-5%	RCR3062	1
R165	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R166	R,METAL	1/4W	100	OHM +-1%	RME0652	1
R167	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R168	R,METAL	1/4W	825	OHM +-1%	RME0663	1
R169	R,CARBON	1/4W	1.5	KOHM +-5%	RCR3056	1
R170	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R171	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R172	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R173	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R175	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R176	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R180	R,CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R181	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R182	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R183	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R184	R,CARBON	1/4W	68	OHM +-5%	RCR3024	1
R185	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R186	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R187	R,CARBON	1/4W	680	OHM +-5%	RCR3048	1
R188	R,CARBON	1/4W	680	OHM +-5%	RCR3048	1
R189	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R190	R,METAL	1/4W	825	OHM +-1%	RME0663	1
R191	R,METAL	1/4W	825	OHM +-1%	RME0663	1
R192	R,CARBON	1/4W	470	OHM +-5%	RCR3044	1
R193	R,CARBON	1/4W	470	OHM +-5%	RCR3044	1
R194	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R195	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1

Symbol	Description	Code	Qty
R196	R,CARBON 1/4W 47 OHM +-5%	RCR3020	1
R197	R,CARBON 1/4W 15 KOHM +-5%	RCR3080	1
R198	R,CARBON 1/4W 5.6 KOHM +-5%	RCR3070	1
RV127	VR,METAL TM8KH1-7E1 10K OHM	RNT0181	1
RV133	VR,METAL TM10K(PV)1SB 2K OHM	RNT0033	1
RV151	SW,ROTARY S21P 3310 (WITH VR)	HX3142079	R
RV164	VR,METAL TM8KH1-7E1 2K OHM	RNT0182	1
RV184	VR,METAL TM8KH1-7E1 200 OHM	RNT0183	1
RV197	VR,METAL TM8KH1-7E1 50K OHM	TNT0184	1
RV198	VR,CARBON EVH-YK3325B14	RDE0003	1
L134	COIL FL-3H R47M	TLF0052	1
P102	CONNECTOR 171825-3	JBX0468	1
P103	CONNECTOR 171825-3	JBX0468	1
S102	SW,ROTARY S21P 3310 (WITH VR)	HX3142079	1
S103	SW,PB UEG22-2 (LOCK)	HX8311793-C	1
	CONNECTOR 163740-1	JBX0557	1
C204	C,AL ELYC 25 V 10 UF	CEC0175	1
C206	C,CERAMIC 50 V 2 PF+-0.25PF	CCC0996	1
C211	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C216	C,AL ELYC 25 V 10 UF	CEC0175	1
C221	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C223	C,AL ELYC 25 V 10 UF	CEC0175	1
C224	C,AL ELYC 25 V 10 UF	CEC0175	1
C225	C,AL ELYC 25 V 10 UF	CEC0175	1
C233	C,AL ELYC 50 V 1 UF	CET0031	1
C234	C,CERAMIC 50 V 15 PF+-5	CCC1004	1
C237	C,AL ELYC 25 V 10 UF	CEC0175	1
C235	C,CERAMIC 50 V 22 PF+-5	CCC1007	1
C241	C,CERAMIC 50 V 10 PF+-0.5PF	CCC1002	1
C244	C,AL ELYC 25 V 10 UF	CEC0175	1

Symbol	Description				Code	Qty
D201	DIODE	1S2075 K			HDS0108	1
D202	DIODE	1S2075 K			HDS0108	1
D203	DIODE	1S2075 K			HDS0108	1
D204	DIODE	1S2075 K			HDS0108	1
D205	DIODE	1S2075 K			HDS0108	1
D206	DIODE	1S2075 K			HDS0108	1
D207	DIODE	1S2075 K			HDS0108	1
D208	DIODE	1S2075 K			HDS0108	1
D209	DIODE	1S2075 K			HDS0108	1
D210	DIODE	1S2075 K			HDS0108	1
D211	DIODE	1S2075 K			HDS0108	1
D212	DIODE	1S2075 K			HDS0108	1
D213	DIODE	1S2075 K			HDS0108	1
D214	DIODE	1S2075 K			HDS0108	1
D215	DIODE	1S2075 K			HDS0108	1
D216	DIODE	1S2075 K			HDS0108	1
D217	DIODE	1S2075 K			HDS0108	1
IC201	IC,DIGITAL	HD74LS109AP			IDH0713	1
IC202	IC,DIGITAL	HD74LS09P			IDH0680	1
R201	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R202	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R203	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R204	R,CARBON	1/4W	8.2	KOHM +-5%	RCR3074	1
R205	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R206	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R207	R,METAL	1/4W	619	OHM +-1%	RME0693	1
R209	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R210	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R211	R,CARBON	1/4W	680	OHM +-5%	RCR3048	1
R212	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1

Symbol	Description				Code	Qty
R213	R,METAL	1/4W	825	OHM +-1%	RME0663	1
R214	R,METAL	1/4W	825	OHM +-1%	RME0663	1
R215	R,CARBON	1/4W	470	OHM +-5%	RCR3044	1
R221	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R222	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R223	R,METAL	1/4W	1.82	KOHM +-1%	RME0667	1
R224	R,METAL	1/4W	1.82	KOHM +-1%	RME0667	1
R225	R,METAL	1/4W	1.21	KOHM +-1%	RME0665	1
R226	R,METAL	1/4W	1.21	KOHM +-1%	RME0665	1
R227	R,METAL	1/4W	1.21	KOHM +-1%	RME0665	1
R229	R,METAL	1/4W	182	OHM +-1%	RME0655	1
R230	R,METAL	1/4W	182	OHM +-1%	RME0655	1
R231	R,METAL	1/4W	221	OHM +-1%	RME0656	1
R232	R,METAL	1/4W	221	OHM +-1%	RME0656	1
R233	R,CARBON	1/4W	39	KOHM +-5%	RCR3090	1
R234	R,CARBON	1/4W	3.9	KOHM +-5%	RCR3066	1
R235	R,CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R237	R,METAL	1/4W	909	OHM +-1%	RME0714	1
R238	R,METAL	1/4W	909	OHM +-1%	RME0714	1
R239	R,METAL	1/4W	86.6	OHM +-0.5%	RME0713	1
R240	R,METAL	1/4W	86.6	OHM +-0.5%	RME0713	1
R241	R,CARBON	1/4W	220	OHM +-5%	RCR3036	1
R243	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R244	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R251	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R252	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R253	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
TR201	TRANSISTOR	2SC535B			HTC0167	1
TR202	TRANSISTOR	2SC535B			HTC0167	1
TR203	TRANSISTOR	2SA781K			HTA0099	1

Symbol	Description	Code	Qty
TR204	TRANSISTOR 2SA781K	HTA0099	1
TR205	TRANSISTOR 2SC1906	HTC0338	1
TR206	TRANSISTOR 2SC1906	HTC0338	1
RV204	VR,METAL TM10K(PV)1SB 10K OHM	RNT0031	1
P201	CONNECTOR 171825-3	JBX0468	1
P202	CONNECTOR 171825-6	JBX0470	1
P203	CONNECTOR 171825-3	JBX0468	1
P204	CONNECTOR 171825-3	JBX0468	1
S201	SW,LEVER SLA225	SSL0056	1
S202	SW,PB UEG22-2 (LOCK)	HX8311793-C	1
PEF-475	PCB PB-2(PEF-475)	HX116441	1
		HX3142112	R
PEF-487	PCB PB-3(PEF-476,477,487)	HX116442	R

ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-476)

Symbol	Description	Code	Qty
C401	C,CERAMIC 500 V 22 PF+-10%	CCC0776	1
C402	C,CERAMIC 500 V 47 PF+-5%	CCC0868	1
C403	C,CERAMIC 500 V 1000 PF+-10%	CCD0217	1
C404	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C405	C,AL ELYC 25 V 10 UF	CEC0175	1
C406	C,AL ELYC 25 V 10 UF	CEC0175	1
C408	C,PLASTIC 50 V 47000 PF+-10%	CQA0101	1
C412	C,PLASTIC 600 V 22000 PF+-10%	CQX0071	1
C414	C,CERAMIC 50 V 1 PF+-0.25PF	CCC1133	1
C417	C,PLASTIC 50 V 47000 PF+-10%	CQA0101	1
C425	C,AL ELYC 25 V 10 UF	CEC0175	1
C428	C,CERAMIC 50 V 220 PF+-10%	CCC1027	1
C441	C,CERAMIC 50 V 100 PF+-10%	CCC1025	1
C442	C,AL ELYC 50 V 1 UF	CET0031	1
C444	C,AL ELYC 16 V 47 UF	CEC0170	1
C446	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C447	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C448	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C449	C,AL ELYC 25 V 10 UF	CEC0175	1
C450	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C451	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1
C461	C,AL ELYC 25 V 10 UF	CEC0175	1
C462	C,AL ELYC 16 V 47 UF	CEC0170	1
C463	C,AL ELYC 25 V 10 UF	CEC0175	1
C507	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C501	C,AL ELYC 25 V 10 UF	CEC0175	1
C506	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C511	C,PLASTIC 50 V 0.1 UF+-10%	CQA0103	1
CV402	C,VARIABLE ECV-1ZW20 ×40	CVE0019	1
C590	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1

Symbol	Description	Code	Qty
C589	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
D401	DIODE MA161	HDM0051	1
D402	DIODE 1S2075K	HDS0108	1
D403	DIODE 1S2075K	HDS0108	1
D405	DIODE 1S2075K	HDS0108	1
D406	DIODE 1S2075K	HDS0108	1
D407	DIODE 1S2075K	HDS0108	1
D408	DIODE 1S2075K	HDS0108	1
D409	DIODE 1S2075K	HDS0108	1
D410	DIODE 1S2075K	HDS0108	1
D411	DIODE 1S2075K	HDS0108	1
D412	DIODE 1S2075K	HDS0108	1
D413	DIODE 1S2075K	HDS0108	1
D414	DIODE 1S2075K	HDS0108	1
D712	DIODE 1S2075K	HDS0108	1
IC401	IC,ANALOG TL081CP	ILT0037	1
IG402	IC,DIGITAL HD74S00	IDH0402	1
IC403	IC,DIGITAL HD74LS00P	IDH0467	1
IC501	IC,DIGITAL HD74S74	IDH0428	1
IC503	IC,DIGITAL HD74LS00P	IDH0467	1
DI402	DIODE SR103D	HDS0234	1
R401	R,CARBON 1/4W 47 OHM +-5%	RCR3020	1
R402	R,CARBON 1/4W 470 KOHM +-5%	RCR3104	1
R403	R,CARBON 1/4W 100 OHM +-5%	RCR3028	1
R404	R,SOLID 1/2W 10 MOHM +-5%	RSE0311	1
R405	R,CARBON 1/4W 680 OHM +-5%	RCR3048	1
R406	R,CARBON 1/4W 10 KOHM +-5%	RCR3076	1
R407	R,CARBON 1/4W 680 OHM +-5%	RCR3048	1
R408	R,CARBON 1/4W 3.3 KOHM +-5%	RCR3064	1
R409	R,CARBON 1/4W 820 OHM +-5%	RCR3050	1
R410	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1

Symbol	Description				Code	Qty
R411	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R412	R,METAL	1/4W	392	KOHM +-1%	RME0722	1
R413	R,METAL	1/4W	100	KOHM +-1%	RME0688	1
R414	R,METAL	1/4W	365	KOHM +-1%	RME0697	1
R415	R,METAL	1/4W	100	KOHM +-1%	RME0688	1
R416	R,METAL	1/4W	5.36	KOHM +-1%	RME0698	1
R417	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R418	R,CARBON	1/4W	3.9	KOHM +-5%	RCR3066	1
R419	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R420	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R421	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R422	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R423	R,CARBON	1/4W	68	OHM +-5%	RCR3024	1
R424	R,CARBON	1/4W	390	OHM +-5%	RCR3042	1
R425	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R426	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R427	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R428	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R429	R,CARBON	1/4W	1.5	KOHM +-5%	RCR3056	1
R430	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R432	R,CARBON	1/4W	390	OHM +-5%	RCR3042	1
R433	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R434	R,CARBON	1/4W	33	OHM +-5%	RCR3016	1
R435	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R436	R,CARBON	1/4W	2.7	KOHM +-5%	RCR3062	1
R437	R,CARBON	1/4W	2.7	KOHM +-5%	RCR3062	1
R440	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R441	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R442	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R443	R,CARBON	1/4W	47	KOHM +-5%	RCR3092	1

Symbol	Description			Code	Qty
R444	R,CARBON	1/4W	3.3 KOHM +-5%	RCR3064	1
R445	R,CARBON	1/4W	10 KOHM +-5%	RCR3076	1
R446	R,CARBON	1/4W	1.0 KOHM +-5%	RCR3052	1
R447	R,CARBON	1/4W	3.3 KOHM +-5%	RCR3064	1
R448	R,CARBON	1/4W	10 OHM +-5%	RCR3004	1
R449	R,CARBON	1/4W	10 OHM +-5%	RCR3004	1
R451	R,CARBON	1/4W	100 OHM +-5%	RCR3028	1
R452	R,CARBON	1/4W	100 OHM +-5%	RCR3028	1
R461	R,CARBON	1/4W	330 OHM +-5%	RCR3040	1
R462	R,SOLID	1/2W	10 MOHM +-5%	RSE0311	1
R463	R,CARBON	1/4W	1.0 KOHM +-5%	RCR3052	1
R501	R,CARBON	1/4W	10 KOHM +-5%	RCR3076	1
R502	R,CARBON	1/4W	220 OHM +-5%	RCR3036	1
R503	R,CARBON	1/4W	2.7 KOHM +-5%	RCR3062	1
R504	R,CARBON	1/4W	4.7 KOHM +-5%	RCR3068	1
R505	R,CARBON	1/4W	10 KOHM +-5%	RCR3076	1
R506	R,CARBON	1/4W	3.3 KOHM +-5%	RCR3064	1
R507	R,CARBON	1/4W	100 OHM +-5%	RCR3028	1
R508	R,CARBON	1/4W	100 OHM +-5%	RCR3028	1
R509	R,CARBON	1/4W	4.7 KOHM +-5%	RCR3068	1
R511	R,CARBON	1/4W	470 OHM +-5%	RCR3044	1
R512	R,CARBON	1/4W	12 KOHM +-5%	RCR3078	1
R510	R,CARBON	1/4W	10 KOHM +-5%	RCR3076	1
R538	R,CARBON	1/4W	3.3 KOHM +-5%	RCR3064	1
R539	R,CARBON	1/4W	220 OHM +-5%	RCR3036	1
RV418	VR,CARBON	EVH-YK3325B14		RDE0003	1
L462	COIL	FL-5H 101K		TLF0067	1
L432	COIL	FL-3H IROM		TLF0054	1
R464	R,CARBON	1/4W	2.2 KOHM +-5%	RCR3060	1
TR401	TRANSISTOR	2SK106C		HTK0068	1

Symbol	Description	Code	Qty
TR402	TRANSISTOR 2SC1906	HTC0338	1
TR403	TRANSISTOR 2SC1906	HTC0338	1
TR404	TRANSISTOR 2SC1906	HTC0338	1
TR405	TRANSISTOR 2SC1906	HTC0338	1
TR406	TRANSISTOR 2SC1906	HTC0338	1
TR407	TRANSISTOR 2SA836D	HTA0105	1
TR501	TRANSISTOR 2SC458C	HTC0148	1
TR502	TRANSISTOR 2SC458C	HTC0148	1
TR507	TRANSISTOR 2SC458C	HTC0148	1
P401	CONNECTOR 171825-3	JBX0468	1
P402	CONNECTOR 171825-3	JBX0468	1
P403	CONNECTOR 171825-3	JBX0468	1
P405	CONNECTOR 171825-3	JBX0468	1
P406	CONNECTOR 171825-3	JBX0468	1
P408	CONNECTOR 171825-6	JBX0470	1
S401	SW,LEVER SLA225	SSL0056	1
S402	SW,LEVER SLA225	SSL0056	1
S403	SW,LEVER SLA225	SSL0056	1
S404	SW,PB UEG22-2 (NON-LOCK)	HX8311793-D	1
C601	C,CERAMIC 500 V 47 PF+-5%	CCC0868	1
C602	C,CERAMIC 500 V 27 PF+-10%	CCC0777	1
C604	C,PLASTIC 600 V 22000 PF+-10%	CQX0071	1
C605	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C607	C,AL ELYC 25 V 10 UF	CEC0175	1
C608	C,AL ELYC 25 V 10 UF	CEC0175	1
C625	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C627	C,AL ELYC 25 V 10 UF	CEC0175	1
C628	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C631	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C713	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1

Symbol	Description	Code	Qty
C791	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C792	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
D601	DIODE 1S2075K	HDS0108	1
D602	DIODE 1S2075K	HDS0108	1
D603	DIODE 1S2075K	HDS0108	1
D605	DIODE 1S2075K	HDS0108	1
D606	DIODE 1S2075K	HDS0108	1
D607	DIODE 1S2075K	HDS0108	1
D608	DIODE 1S2075K	HDS0108	1
D609	DIODE 1S2075K	HDS0108	1
D610	DIODE 1S2075K	HDS0108	1
D501	DIODE 1S2075K	HDS0108	1
D502	DIODE 1S2075K	HDS0108	1
D503	DIODE 1S2075K	HDS0108	1
D507	DIODE 1S2075K	HDS0108	1
D508	DIODE 1S2075K	HDS0108	1
D509	DIODE 1S2075K	HDS0108	1
D510	DIODE 1S2075K	HDS0108	1
D511	DIODE 1S2075K	HDS0108	1
D519	DIODE 1S2075K	HDS0108	1
TR601	TRANSISTOR 2SK106C	HTK0068	1
TR602	TRANSISTOR 2SC1906	HTC0338	1
TR603	TRANSISTOR 2SC1906	HTC0338	1
TR604	TRANSISTOR 2SC1906	HTC0338	1
TR605	TRANSISTOR 2SC1906	HTC0338	1
IC601	IC,DIGITAL HD74S00	IDH0402	1
IC602	IC,DIGITAL HD74LS00P	IDH0467	1
IC701	IC,DIGITAL HD74S74	IDH0428	1
R601	R,CARBON 1/4W 470 KOHM +-5%	RCR3104	1
R602	R,CARBON 1/4W 100 OHM +-5%	RCR3028	1

Symbol	Description			Code	Qty
R603	R,CARBON	1/4W 100	OHM +-5%	RCR3028	1
R606	R,CARBON	1/4W 100	OHM +-5%	RCR3028	1
R607	R,CARBON	1/4W 10	OHM +-5%	RCR3004	1
R608	R,CARBON	1/4W 10	KOHM +-5%	RCR3076	1
R609	R,CARBON	1/4W 680	OHM +-5%	RCR3048	1
R610	R,CARBON	1/4W 3.3	KOHM +-5%	RCR3064	1
R615	R,CARBON	1/4W 470	KOHM +-5%	RCR3104	1
R616	R,CARBON	1/4W 470	OHM +-5%	RCR3044	1
R617	R,CARBON	1/4W 4.7	KOHM +-5%	RCR3068	1
R618	R,CARBON	1/4W 10	KOHM +-5%	RCR3076	1
R619	R,CARBON	1/4W 47	OHM +-5%	RCR3020	1
R621	R,CARBON	1/4W 1.0	KOHM +-5%	RCR3052	1
R622	R,CARBON	1/4W 100	OHM +-5%	RCR3028	1
R627	R,CARBON	1/4W 1.0	KOHM +-5%	RCR3052	1
R628	R,CARBON	1/4W 390	OHM +-5%	RCR3042	1
R629	R,CARBON	1/4W 33	OHM +-5%	RCR3016	1
R630	R,CARBON	1/4W 3.3	KOHM +-5%	RCR3064	1
R631	R,CARBON	1/4W 2.7	KOHM +-5%	RCR3062	1
R632	R,CARBON	1/4W 2.7	KOHM +-5%	RCR3062	1
R633	R,CARBON	1/4W 100	OHM +-5%	RCR3028	1
R634	R,CARBON	1/4W 6.8	KOHM +-5%	RCR3072	1
R712	R,CARBON	1/4W 47	OHM +-5%	RCR3020	1
R713	R,CARBON	1/4W 47	OHM +-5%	RCR3020	1
R714	R,CARBON	1/4W 47	OHM +-5%	RCR3020	1
R715	R,CARBON	1/4W 10	OHM +-5%	RCR3004	1
RV618	VR,CARBON	EVH-YK3325B14		RDE0003	1
L628	COIL	FL-3H 1R0M		TLF0054	1
P603	CONNECTOR	171825-3		JBX0468	1
P701	CONNECTOR	171825-6		JBX0470	1
P501	CONNECTOR	171825-6		JBX0470	1

Symbol	Description		Code	Qty
S601	SW,LEVER	SLA225	SSL0056	1
	WIRE	1/0.4 × 2 (ORANGE & BLACK)	BBI0037	0.5meter
PEF-476	PCB	PB-3 (PEF-476,477,487)	HX116442	1

ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-477)

Symbol	Description	Code	Qty
C514	C,CERAMIC 50 V 22 PF+-5%	CCC1007	1
C516	C,CERAMIC 50 V 220 PF+-10%	CCC1027	1
C520	C,CERAMIC 50 V 22 PF+-5%	CCC1007	1
C523	C,PLASTIC 50 V 10000 PF+-10%	CQA0097	1
C527	C,CERAMIC 50 V 10 PF+-0.5PF	CCC1002	1
C528	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C543	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C544	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C548	C,AL ELYC 25 V 10 UF	CEC0175	1
C551	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C556	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C557	C,CERAMIC 50 V 220 PF+-10%	CCC1027	1
C558	C,CERAMIC 50 V 680 PF+-10%	CCC1365	1
C559	C,CERAMIC 50 V 100 PF+-10%	CCC1025	1
C560	C,AL ELYC 16 V 47 UF	CEC0170	1
C561	C,PLASTIC 1MF+0.01MF 100V +-0.5%	HX3142077-A	1
C562	C,PLASTIC 50 V 4700 PF+-10%	CQA0095	1
C563	C,PLASTIC 1MF+0.01MF 100V +-0.5%	HX3142077-A	R
C564	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C565	C,AL ELYC 25 V 10 UF	CEC0175	1
C566	C,AL ELYC 50 V 1 UF NP	CEC0391	1
C567	C,PLASTIC 50 V 0.1 UF+-10%	CQA0103	1
C568	C,PLASTIC 50 V 10000 PF+-10%	CQA0097	1
C569	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1
C570	C,CERAMIC 50 V 100 PF+-10%	CCC1025	1
C571	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C577	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C582	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C583	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C588	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1

Symbol	Description	Code	Qty
C591	C,CERAMIC 50 V 220 PF+-10%	CCC1027	1
C592	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C593	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C596	C,AL ELYC 160 V 1 UF	CEC0213	1
C597	C,AL ELYC 25 V 10 UF	CEC0175	1
C598	C,AL ELYC 16 V 47 UF	CEC0170	1
C599	C,AL ELYC 25 V 10 UF	CEC0175	1
CV514	C,VARIABLE ECV-1ZW20 ×40	CVE0019	1
CV564	C,VARIABLE ECV-1ZW20 ×40	CVE0019	1
D504	DIODE MA161	HDM0051	1
D505	DIODE MA161	HDM0051	1
D506	DIODE MA161	HDM0051	1
D512	DIODE 1S2075K	HDS0108	1
D513	DIODE 1S2075K	HDS0108	1
D514	DIODE 1S2075K	HDS0108	1
D515	DIODE 1S2075K	HDS0108	1
D516	DIODE 1S2075K	HDS0108	1
D517	DIODE 1S2075K	HDS0108	1
D518	DIODE 1S2075K	HDS0108	1
D520	DIODE 1S2075K	HDS0108	1
IC504	IC,DIGITAL HD7402P	IDH0179	1
IC505	IC,DIGITAL MC14053BCP	IDM0113	1
IC506	IC,DIGITAL MC14053BCP	IDM0113	1
IC507	IC,ANALOG TL081CP	ILT0037	1
TR503	TRANSISTOR 2SK106C	HTK0068	1
TR504	TRANSISTOR 2SC458C	HTC0148	1
TR505	TRANSISTOR 2SC1906	HTC0338	1
TR506	TRANSISTOR 2SC458C	HTC0148	1
TR508	TRANSISTOR 2SC458C	HTC0148	1
TR509	TRANSISTOR 2SA836D	HTA0105	1

Symbol	Description				Code	Qty
TR510	TRANSISTOR	2SA836D			HTA0105	1
TR511	TRANSISTOR	2SC458C			HTC0148	1
R513	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R514	R,CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
R515	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1
R516	R,SOLID	1/2W	10	MOHM +-5%	RSE0311	1
R517	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R518	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R519	R,CARBON	1/4W	12	KOHM +-5%	RCR3078	1
R520	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R522	R,METAL	1/4W	1.00	KOHM +-1%	RME0664	1
R523	R,METAL	1/4W	22.1	KOHM +-1%	RME0680	1
R526	R,METAL	1/4W	22	KOHM +-5%	RMR2784	1
R527	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R528	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R529	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R531	R,METAL	1/4W	2.21	KOHM +-1%	RME0668	1
R532	R,METAL	1/4W	3.09	KOHM +-1%	RME0720	1
R533	R,CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
R534	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R535	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R541	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R542	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R543	R,CARBON	1/4W	180	KOHM +-5%	RCR3420	1
R544	R,CARBON	1/4W	47	KOHM +-5%	RCR3092	1
R545	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R546	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R547	R,METAL	1/4W	22	KOHM +-5%	RMR2784	1
R548	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R549	R,METAL	1/4W	15.0	KOHM +-1%	RME0678	1

Symbol	Description				Code	Qty
R552	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R553	R,METAL	1/4W	1.50	KOHM +-1%	RME0666	1
R556	R,CARBON	1/4W	270	OHM +-5%	RCR3038	1
R557	R,CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
R558	R,CARBON	1/4W	470	OHM +-5%	RCR3044	1
R559	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1
R561	R,METAL	1/2W	4.32	MOHM +-1%	RMR3283	1
R562	R,METAL	1/2W	1.43	MOHM +-1%	RMR3282	1
R563	R,METAL	1/8W	715	KOHM +-0.5%	RMR2262	1
R564	R,METAL	1(4W	429	KOHM +-0.5%	RME0699	1
R565	R,METAL	1/4W	143	KOHM +-0.5%	RME0718	1
R566	R,METAL	1/4W	71.5	KOHM +-0.5%	RME0717	1
R567	R,METAL	1/4W	71.5	KOHM +-0.5%	RME0717	1
R568	R,METAL	1/4W	17.8	KOHM +-0.5%	RME0700	1
R569	R,METAL	1/4W	17.8	KOHM +-0.5%	RME0700	1
R570	R,CARBON	1/4W	470	KOHM +-5%	RCR3104	1
R571	R,CARBON	1/4W	1.2	KOHM +-5%	RCR3054	1
R572	R,CARBON	1/4W	1.5	KOHM +-5%	RCR3056	1
R573	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R574	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R575	R,CARBON	1/4W	12	KOHM +-5%	RCR3078	1
R576	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R577	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R578	R,CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
R579	R,CARBON	1/4W	820	OHM +-5%	RCR3050	1
R581	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1
R582	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1
R583	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1
R584	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1
R585	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1

Symbol	Description	Code	Qty
R586	R,CARBON 1/4W 15 KOHM +-5%	RCR3306	1
R587	R,CARBON 1/4W 15 KOHM +-5%	RCR3306	1
R588	R,METAL 1/4W 4.75 KOHM +-1%	RME0672	1
R589	R,METAL 1/4W 4.75 KOHM +-1%	RME0672	1
R590	R,CARBON 1/4W 6.8 KOHM +-5%	RCR3072	1
R591	R,CARBON 1/4W 4.7 KOHM +-5%	RCR3068	1
R592	R,CARBON 1/4W 4.7 KOHM +-5%	RCR3068	1
R593	R,CARBON 1/4W 6.8 KOHM +-5%	RCR3072	1
R594	R,CARBON 1/4W 120 KOHM +-5%	RCR3417	1
R595	R,CARBON 1/4W 100 OHM +-5%	RCR3028	1
R596	R,CARBON 1/4W 3.3 KOHM +-5%	RCR3064	1
R597	R,CARBON 1/4W 330 OHM +-5%	RCR3040	1
R598	R,CARBON 1/4W 3.9 KOHM +-5%	RCR3066	1
RV544	VR,CARBON 1 KOHM & 500 KOHM (WITH SW)	HX3142080	1
RV590	VR,CARBON EVL-SOAA00B53	RDE0004	1
RV591	VR,CARBON EVL-SOAA00B22	RDE0012	1
L558	COIL FL-3H 100K	TLF0028	1
L598	COIL FL-5H 101K	TLF0067	1
P502	CONNECTOR 171825-6	JBX0470	1
P503	CONNECTOR 171825-6	JBX0470	1
P504	CONNECTOR 171825-6	JBX0470	1
P506	CONNECTOR 171825-3	JBX0468	1
P505	CONNECTOR 171825-6	JBX0470	1
P508	CONNECTOR 171825-3	JBX0468	1
P509	CONNECTOR 171825-3	JBX0468	1
P510	CONNECTOR 171825-3	JBX0468	1
S501	SW,ROTARY S21P 3322/2219	HX3142078	1
S502	SW,LEVER SLA225	SSL0056	1
C701	C,CERAMIC 50 V 22 PF+-5%	CCC1007	1
C704	C,CERAMIC 50 V 22 PF+-5%	CCC1007	1

Symbol	Description	Code	Qty
C705	C,CERAMIC 50 V 220 PF+-10%	CCC1027	1
C715	C,PLASTIC 50 V 10000 PF+-10%	CQA0097	1
C723	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C725	C,CERAMIC 50 V 10 PF+-0.5PF	CCC1002	1
C726	C,PLASTIC 1MF+0.01MF 100V+-0.5%	HX3142077-A	1
C727	C,PLASTIC 50 V 4700 PF+-10%	CQA0095	1
C728	C,PLASTIC 1MF+0.01MF 100V+-0.5%	HX3142077-A	R
C729	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
CV701	C,VARIABLE ECV-1ZW20×40	CVE0019	1
CV729	C,VARIABLE ECV-1ZW20×40	CVE0019	1
D701	DIODE MA161	HDM0051	1
D702	DIODE MA161	HDM0051	1
D703	DIODE MA161	HDM0051	1
D704	DIODE 1S2075K	HDS0108	1
D705	DIODE 1S2075K	HDS0108	1
IC702	IC,DIGITAL HD74LS00P	IDH0467	1
IC703	IC,ANALOG TL081CP	ILT0037	1
TR701	TRANSISTOR 2SK106C	HTK0068	1
TR702	TRANSISTOR 2SC458C	HTC0148	1
TR703	TRANSISTOR 2SC1906	HTC0338	1
TR704	TRANSISTOR 2SC458C	HTC0148	1
P702	CONNECTOR 171825-6	JBX0470	1
S701	SW,ROTARY S21P 3322/2219	HX3142078	R
R701	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R702	R,CARBON 1/4W 2.2 KOHM +-5%	RCR3060	1
R703	R,CARBON 1/4W 22 KOHM +-5%	RCR3084	1
R704	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R705	R,SOLID 1/2W 10 MOHM +-5%	RSE0311	1
R706	R,CARBON 1/4W 100 OHM +-5%	RCR3028	1
R707	R,CARBON 1/4W 4.7 KOHM +-5%	RCR3068	1

Symbol	Description	Code	Qty
R708	R,CARBON 1/4W 12 KOHM +-5%	RCR3078	1
R709	R,METAL 1W 22 KOHM +-5%	RMR2784	1
R710	R,CARBON 1/4W 100 OHM +-5%	RCR3028	1
R711	R,CARBON 1/4W 3.3 KOHM +-5%	RCR3064	1
R716	R,CARBON 1/4W 100 OHM +-5%	RCR3028	1
R717	R,METAL 1/4W 2.21 KOHM +-1%	RME0668	1
R718	R,METAL 1/4W 3.09 KOHM +-1%	RME0720	1
R722	R,METAL 1/4W 1.00 KOHM +-1%	RME0664	1
R723	R,METAL 1/4W 22.1 KOHM +-1%	RME0680	1
R726	R,METAL 1/2W 1.43 MOHM +-1%	RMR3282	1
R727	R,METAL 1/2W 715 KOHM +-0.5%	RMR2262	1
R728	R,METAL 1/2W 715 KOHM +-0.5%	RMR2262	1
R729	R,METAL 1/4W 143 KOHM +-0.5%	RME0718	1
R730	R,METAL 1/4W 71.5 KOHM +-0.5%	RME0717	1
R731	R,METAL 1/4W 71.5 KOHM +-0.5%	RME0717	1
R734	R,METAL 1/4W 1.00 KOHM +-1%	RME0664	1
R736	R,METAL 1/4W 17.8 KOHM +-0.5%	RME0700	1
R737	R,METAL 1/4W 17.8 KOHM +-0.5%	RME0700	1
R738	R,METAL 1/4W 71.5 KOHM +-0.5%	RME0717	1
R739	R,CARBON 1/4W 2.7 KOHM +-5%	RCR3062	1
R740	R,CARBON 1/4W 470 KOHM +-5%	RCR3104	1
RV734	VR,CARBON EVL-SOAA00B22	RDE0012	1
C803	C,AL ELYC 16 V 47 UF	CEC0170	1
C820	C,CERAMIC 50 V 5 PF+-0.25PF	CCC0999	1
C821	C,CERAMIC 50 V 5 PF+-0.25PF	CCC0999	1
C822	C,AL ELYC 16 V 47 UF	CEC0170	1
TR822	TRANSISTOR 2SC458C	HTC0148	1
TR823	TRANSISTOR 2SC458C	HTC0148	1
TR824	TRANSISTOR 2SA836D	HTA0105	1
TR825	TRANSISTOR 2SA836D	HTA0105	1

Symbol	Description				Code	Qty
R801	R,METAL	1/4W	3.92	KOHM +-1%	RME0671	1
R803	R,METAL	1/4W	562	OHM +-1%	RME0661	1
R804	R,METAL	1/4W	332	OHM +-1%	RME0658	1
R805	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R806	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R820	R,METAL	1/4W	1.82	KOHM +-1%	RME0667	1
R821	R,METAL	1/4W	1.82	KOHM +-1%	RME0667	1
R822	R,METAL	1/4W	1.00	KOHM +-1%	RME0664	1
R823	R,METAL	1/4W	1.00	KOHM +-1%	RME0664	1
R824	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R825	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R826	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R827	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R891	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R892	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
PEF-477	PCB	PB-3(PEF-476,477,487)			116442	R

ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-478)

Symbol	Description	Code	Qty
C301	C,AL ELYC 25 V 10 UF	CEC0175	1
C304	C,CERAMIC 50 V 5 PF+-0.25PF	CCC0999	1
C305	C,CERAMIC 50 V 22 PF+-5%	CCC1007	1
C306	C,PLASTIC 50 V 3300 PF+-10%	CQA0094	1
C307	C,AL ELYC 25 V 10 UF	CEC0175	1
C309	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C311	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C324	C,CERAMIC 50 V 5 PF+-0.25PF	CCC0999	1
C326	C,AL ELYC 25 V 10 UF	CEC0175	1
C327	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C328	C,AL ELYC 25 V 10 UF	CEC0175	1
C329	C,CERAMIC 50 V 8 PF+-0.5PF	CCC1001	1
C330	C,CERAMIC 50 V 15 PF+-5%	CCC1004	1
C331	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C332	C,CERAMIC 500 V 1 PF+-0.25PF	CCC1353	1
C333	C,CERAMIC 500 V 1 PF+-0.25PF	CCC1353	1
C334	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C335	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C338	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C341	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C342	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C343	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C344	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C345	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C346	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C347	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C348	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
CV304	C,VALIABLE ECV-1ZW10×40	CVE0024	1
CV322	C,VALIABLE ECV-1ZW20×40	CVE0019	1
CV329	C,VALIABLE ECV-1ZW10×40	CVE0024	1

Symbol	Description	Code	Qty
D301	DIODE HZ7B	HDH0040	1
D302	DIODE HZ5B	HDH0029	1
D303	DIODE HZ7B	HDH0040	1
TR301	TRANSISTOR 2SA781K	HTA0099	1
TR302	TRANSISTOR 2SA781K	HTA0099	1
TR303	TRANSISTOR 2SC1906	HTC0338	1
TR304	TRANSISTOR 2SC1906	HTC0338	1
TR305	TRANSISTOR 2SC1374H	HTC0328	1
TR306	TRANSISTOR 2SC1374H	HTC0328	1
TR307	TRANSISTOR 2SD668A-C	HTD0100	1
TR308	TRANSISTOR 2SD668A-C	HTD0100	1
TR309	TRANSISTOR 2SB648A-C	HTB0087	1
TR310	TRANSISTOR 2SB648A-C	HTB0087	1
TR311	TRANSISTOR 2SA741H	HTA0088	1
TR312	TRANSISTOR 2SA741H	HTA0088	1
L336	COIL FL-3H R47M	TLF0052	1
L337	COIL FL-3H R47M	TLF0052	1
P301	CONNECTOR 171825-6	JBX0470	1
P302	CONNECTOR 171825-6	JBX0470	1
J305	PIN FOR CONNECTOR	HX8193940	1
J306	PIN FOR CONNECTOR	HX8193940	1
R301	R,METAL 1/4W 100 OHM +-1%	RME0652	1
R302	R,METAL 1/4W 100 OHM +-1%	RME0652	1
R303	R,CARBON 1/4W 4.7 KOHM +-5%	RCR3068	1
R304	R,CARBON 1/4W 100 OHM +-5%	RCR3028	1
R305	R,CARBON 1/4W 680 OHM +-5%	RCR3048	1
R306	R,CARBON 1/4W 8.2 KOHM +-5%	RCR3074	1
R307	R,METAL 1/4W 1.21 KOHM +-1%	RME0665	1
R308	R,METAL 1/4W 1.21 KOHM +-1%	RME0665	1
R309	R,CARBON 1/4W 47 OHM +-5%	RCR3020	1

Symbol	Description				Code	Qty
R310	R,CARBON	1/4W	150	OHM +-5%	RCR3032	1
R311	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R312	R,CARBON	1/4W	150	OHM +-5%	RCR3032	1
R319	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R320	R,METAL	1/4W	150	OHM +-1%	RME0654	1
R321	R,METAL	1/4W	150	OHM +-1%	RME0654	1
R322	R,CARBON	1/4W	180	OHM +-5%	RCR3034	1
R323	R,CARBON	1/4W	150	OHM +-5%	RCR3032	1
R324	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R325	R,METAL	1/4W	1.00	KOHM +-1%	RME0664	1
R326	R,METAL	1/4W	1.00	KOHM +-1%	RME0664	1
R327	R,METAL	1/4W	274	OHM +-1%	RME0715	1
R328	R,METAL	1/4W	274	OHM +-1%	RME0715	1
R329	R,METAL	1/4W	681	OHM +-1%	RME0662	1
R330	R,METAL	1/4W	681	OHM +-1%	RME0662	1
R331	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R332	R,METAL	1 W	10	KOHM +-5%	RMR2782	1
R333	R,METAL	1 W	10	KOHM +-5%	RMR2782	1
R334	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R335	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R336	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R337	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R338	R,CARBON	1/2W	22	KOHM +-5%	RCR3191	1
R339	R,METAL	1 W	10	KOHM +-5%	RMR2782	1
R340	R,METAL	1 W	10	KOHM +-5%	RMR2782	1
R341	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R342	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R343	R,CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
R344	R,CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
R345	R,METAL	1/4W	182	OHM +-1%	RME0655	1

Symbol	Description	Code	Qty
R346	R,METAL 1/4W 182 OHM +-1%	RME0655	1
R347	R,CARBON 1/4W 47 OHM +-5%	RCR3020	1
R348	R,CARBON 1/4W 47 OHM +-5%	RCR3020	1
R349	R,CARBON 1/4W 47 OHM +-5%	RCR3020	1
R350	R,CARBON 1/4W 47 OHM +-5%	RCR3020	1
R351	R,CARBON 1/4W 10 OHM +-5%	RCR3004	1
C1034	C,CERAMIC 500 V10000 pF+-10%	CCD0218	1
D1032	DIODE HZ22	HDH0072	1
R1032	R,CARBON 1/4W 68 KOHM +-5%	RCR3096	1
R1033	R,CARBON 1/4W 47 KOHM +-5%	RCR3092	1
R1034	R,CARBON 1/4W 33 KOHM +-5%	RCR3088	1
R1036	R,CARBON 1/4W 220 OHM +-5%	RCR3036	1
RV1032	VR,CARBON EVT-S0AA00B25	RDE0029	1
RV1033	VR,CARBON EVT-S0AA00B54 50K OHM	RDE0017	1
PEF-478	PCB PB1 (PEF-478 486)	HX116440	R
		HX283881	R
		HX283882	R

ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-479)

Symbol	Description	Code	Qty
C828	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C832	C,CERAMIC 50 V 470 PF+-10%	CCC1162	1
C840	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C844	C,CERAMIC 500 V 0.5 PF+-0.25PF	CCC0111	1
C845	C,CERAMIC 500 V 0.5 PF+-0.25PF	CCC0111	1
C846	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C847	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C849	C,CERAMIC 50 V10000 PF+80%-20%	CCC1030	1
C854	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C855	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C860	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C842	C,CERAMIC 50 V10000 PF+80%-20%	CCC1030	1
C843	C,CERAMIC 50 V10000 PF+80%-20%	CCC1030	1
D852	DIODE 1S2075K	HDS0108	1
D853	DIODE 1S2075K	HDS0108	1
TR828	TRANSISTOR 2SA836D	HTA0105	1
TR829	TRANSISTOR 2SA836D	HTA0105	1
TR840	TRANSISTOR 2SA836D	HTA0105	1
T841	TRANSISTOR 2SA836D	HTA0105	1
TR846	TRANSISTOR 2SA781K	HTA0099	1
TR847	TRANSISTOR 2SA781K	HTA0099	1
TR852	TRANSISTOR 2SB648A-C	HTB0087	1
TR853	TRANSISTOR 2SB648A-C	HTB0087	1
TR856	TRANSISTOR 2SD668A-C	HTD0100	1
TR857	TRANSISTOR 2SD668A-C	HTD0100	1
R828	R,METAL 1/4W 22.1 KOHM +-1%	RME0680	1
R829	R,METAL 1/4W 22.1 KOHM +-1%	RME0680	1
R830	R,CARBON 1/4W 1.5 KOHM +-5%	RCR3056	1
R831	R,CARBON 1/4W 120 OHM +-5%	RCR3030	1
R832	R,CARBON 1/4W 6.8 KOHM +-5%	RCR3072	1

Symbol	Description	Code	Qty
R840	R,METAL 1/4W 22.1 KOHM +-1%	RME0680	1
R841	R,METAL 1/4W 22.1 KOHM +-1%	RME0680	1
R842	R,METAL 1/4W 1.82 KOHM +-1%	RME0667	1
R843	R,METAL 1/4W 1.82 KOHM +-1%	RME0667	1
R844	R,METAL 1 W 22 KOHM +-5%	RMR2784	1
R845	R,METAL 1 W 22 KOHM +-5%	RMR2784	1
R846	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R847	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R848	R,CARBON 1/4W 220 KOHM +-5%	RCR3102	1
R849	R,CARBON 1/4W 220 KOHM +-5%	RCR3102	1
R850	R,CARBON 1/4W 15 KOHM +-5%	RCR3080	1
R851	R,CARBON 1/4W 15 KOHM +-5%	RCR3080	1
R852	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R853	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R854	R,METAL 1 W 22 KOHM +-5%	RMR2784	1
R855	R,METAL 1 W 22 KOHM +-5%	RMR2784	1
R856	R,CARBON 1/4W 100 OHM +-5%	RCR3028	1
R857	R,CARBON 1/4W 100 OHM +-5%	RCR3028	1
R862	R,CARBON 1/4W 330 OHM +-5%	RCR3040	1
R863	R,CARBON 1/4W 330 OHM +-5%	RCR3040	1
R858	R,CARBON 1/4W 10 OHM +-5%	RCR3004	1
R859	R,CARBON 1/4W 10 OHM +-5%	RCR3004	1
R860	R,CARBON 1/4W 100 KOHM +-5%	RCR3100	1
RV830	VR,METAL TM10K(PV)1SB 1K OHM	RNT0029	1
RV831	VR,METAL TM10K(PV)1SB 100 OHM	RNT0028	1
RV842	VR,METAL TM10K(PV)1SB 500 OHM	RNT0039	1
P801	CONNECTOR 171825-3	JBX0468	1
P802	CONNECTOR 171825-6	JBX0470	1
C905	C,CERAMIC 500 V 0.5 PF+-0.25PF	CCC0111	1
C906	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1

Symbol	Description	Code	Qty
C911	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C902	C,AL ELYC 25 V 10 UF	CEC0175	1
C913	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
D901	DIODE 1S2075k	HDS0108	1
D902	DIODE 1S2075k	HDS0108	1
D908	DIODE 1S2075k	HDS0108	1
R901	R,METAL 1/4W 3.32 KOHM +-1%	RME0670	1
R902	R,CARBON 1/4W 3.9 KOHM +-5%	RCR3066	1
R903	R,CARBON 1/4W 56 KOHM +-5%	RCR3094	1
R904	R,CARBON 1/4W 1.5 KOHM +-5%	RCR3056	1
R905	R,METAL 1 W 22 KOHM +-5%	RMR2784	1
R906	R,CARBON 1/4W 100 KOHM +-5%	RCR3100	1
R907	R,CARBON 1/4W 12 KOHM +-5%	RCR3078	1
R908	R,CARBON 1/4W 1.5 KOHM +-5%	RCR3056	1
R909	R,CARBON 1/2W 33 KOHM +-5%	RCR3195	1
R910	R,CARBON 1/4W 220 OHM +-5%	RCR3036	1
R911	R,CARBON 1/4W 22 OHM +-5%	RCR3012	1
R912	R,CARBON 1/4W 100 OHM +-5%	RCR3028	1
R913	R,CARBON 1/4W 2.2 KOHM +-5%	RCR3060	1
R921	R,CARBON 1/4W 3.9 KOHM +-5%	RCR3066	1
R931	R,CARBON 1/4W 22 KOHM +-5%	RCR3084	1
R932	R,CARBON 1/4W 82 KOHM +-5%	RCR3098	1
R935	R,METAL 1 W 10 MOHM +-5%	HX3142076-B	1
R936	R,CARBON 1/2W 1.8 MOHM +-5%	RCR3476	1
TR901	TRANSISTOR 2SC641K-C	HTC0192	1
TR904	TRANSISTOR 2SC1906	HTC0338	1
TR905	TRANSISTOR 2SD668A-C	HTD0100	1
TR908	TRANSISTOR 2SB648A-C	HTB0087	1
TR936	TRANSISTOR 2SA778AK	HTA0104	1
P901	CONNECTOR 171825-3	JBX0468	1

Symbol	Description	Code	Qty
P902	CONNECTOR 171825-3	JBX0468	1
P903	CONNECTOR 171825-3	JBX0468	1
P904	CONNECTOR 171825-3	JBX0468	1
C1001	C,PLASTIC 50 V47000 PF+-10%	CQA0101	1
C1002	C,AL ELYC 25 V 100 UF	CEC0177	1
C1005	C,PLASTIC 50 V47000 PF+-10%	CQA0101	1
C1012	C,CERAMIC 2000 V 4700 PF+-10%	CCD0221	1
C1013	C,CERAMIC 2000 V 4700 PF+-10%	CCD0221	1
C1016	C,CERAMIC 2000 V 100 PF+-10%	CCC1366	1
C1020	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C1021	C,AL ELYC 160 V 1 UF	CEC0213	1
C1023	C,CERAMIC 2000 V 4700 PF+-10%	CCD0221	1
C1025	C,CERAMIC 2000 V 4700 PF+-10%	CCD0221	1
D1013	DIODE Y10GA	HDY0031	1
D1020	DIODE HZ22	HDH0072	1
D1021	DIODE 1SS83	HDS0250	1
D1022	DIODE 1SS83	HDS0250	1
D1023	DIODE 1SS83	HDS0250	1
D1024	DIODE 1SS83	HDS0250	1
IC1001	IC,ANALOG TL081CP	ILT0037	1
TR1006	TRANSISTOR 2SC1061C	HTC0032	1
R1001	R,METAL 1/4W 182 KOHM +-1%	RME0721	1
R1002	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R1003	R,CARBON 1/4W 100 KOHM +-5%	RCR3100	1
R1004	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R1005	R,CARBON 1/4W 3.3 KOHM +-5%	RCR3064	1
R1006	R,CARBON 1/4W 33 OHM +-5%	RCR3016	1
R1014	R,CARBON 1/4W 10 KOHM +-5%	RCR3076	1
R1015	R,METAL 1 W 22 MOHM +-1%	HX3142076-A	1
R1016	R,CARBON 1/2W 3.3 MOHM +-5%	RCR4282	1

Symbol	Description	Code	Qty
R1020	R,CARBON 1/4W 680 KOHM +-5%	RCR3105	1
R1024	R,SOLID 1/2W 10 MOHM +-5%	RSE0311	1
RV1021	VR,CARBON EVT-S0AA00B25	RDE0029	1
NL1024	LAMP NE-2	ELL0019	1
NL1025	LAMP NE-2	ELL0019	1
T1001	XFMR HIGH VOLTAGE XFMR (FOR V-550)	HX3142082 - A	1
MUT1001	MULTIPLIER 8.5KV (WITH ANODE CAP)	HX3142083 - A	1
F1001	FUSE MF61NM 1 (1A 250V)JIS	EFG0344	1
FH1001	SOCKET,FUS F-3265 1P PHENOLIT RESIN	EFH0026	1
D1101	DIODE M4G-1	HDM0034	1
D1102	DIODE 1S2075K	HDS0108	1
D1103	DIODE 1S2075K	HDS0108	1
D1111	DIODE M4C-1	HDM0033	1
D1114	DIODE V06C	HDV0019	1
D1121	DIODE V06C	HDV0019	1
D1141	DIODE V06C	HDV0019	1
D1142	DIODE V06C	HDV0019	1
IC1101	IC,ANALOG HA17458GS	ILH0054	1
IC1111	IC,DIGITAL UA7812UC	IDM0318	1
IC1121	IC,DIGITAL UA7912UC	IDM0319	1
IC1131	IC,DIGITAL UA7805UC	IDM0320	1
TR1101	TRANSISTOR 2SD478C	HTD0053	1
TR1102	TRANSISTOR 2SD478C	HTD0053	1
TR1161	TRANSISTOR 2SC1061C	HTC0032	1
TR1162	TRANSISTOR 2SC458C	HTC0148	1
R1101	R,CARBON 1/4W 15 KOHM +-5%	RCR3080	1
R1102	R,CARBON 1/4W 10 KOHM +-5%	RCR3076	1
R1103	R,CARBON 1/4W 10 KOHM +-5%	RCR3076	1
R1104	R,METAL 1/4W 100 KOHM +-1%	RME0688	1
R1105	R,METAL 1/4W 12.1 KOHM +-1%	RME0677	1

Symbol	Description	Code	Qty
R1111	R,METAL 2 W 33 OHM +-5%	RMR2790	1
R1112	R,CARBON 1/4W 680 OHM +-5%	RCR3048	1
R1113	R,CARBON 1/4W 47 OHM +-5%	RCR3020	1
R1114	R,METAL 1/4W 10.0 KOHM +-1%	RME0676	1
R1115	R,CARBON 1/4W 2.2 KOHM +-5%	RCR3060	1
R1121	R,METAL 2 W 27 OHM +-5%	RMR3151	1
R1122	R,METAL 1/4W 10.0 KOHM +-1%	RME0676	1
R1131	R,METAL 2 W 47 OHM +-5%	RMR2791	1
R1151	R,CARBON 1/4W 470 KOHM +-5%	RCR3104	1
R1152	R,CARBON 1/4W 4.7 KOHM +-5%	RCR3068	1
R1162	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
RV1111	VR,CARBON EVL-SOAA00B53	RDE0004	1
R1106	R,CARBON 1/4W 6.8 OHM +-5%	RCR3003	1
R1107	R,CARBON 1/4W 100 KOHM +-5%	RCR3100	1
C1101	C,AL ELYC 160 V 100 UF	CEC0340	1
C1102	C,AL ELYC 160 V 10 UF	CEC0214	1
C1111	C,AL ELYC 25 V 2200 UF	CEC0347	1
C1112	C,AL ELYC 25 V 100 UF	CEC0177	1
C1113	C,AL ELYC 16 V 100 UF	CEC0364	1
C1121	C,AL ELYC 25 V 2200 UF	CEC0347	1
C1122	C,AL ELYC 25 V 100 UF	CEC0177	1
C1123	C,PLASTIC 50 V10000 PF+-10%	CQA0097	1
C1131	C,CERAMIC 50 V10000 PF+80%-20%	CCC1030	1
C1132	C,AL ELYC 25 V 100 UF	CEC0177	1
C1141	C,AL ELYC 100 V 100 UF	CEC0209	1
C1151	C,PLASTIC 50 V 0.1 MF+-10%	CQA0103	1
P1105	CONNECTOR 171825-3	JBX0468	1
P1101	CONNECTOR 171825-6	JBX0470	1
P1102	CONNECTOR 171825-6	JBX0470	1
P1103	CONNECTOR 171825-6	JBX0470	1

Symbol	Description	Code	Qty
P1104	CONNECTOR 171825-6	JBX0470	1
P1106	CONNECTOR 171825-3	JBX0468	1
P1107	CONNECTOR 171825-3	JBX0468	1
P1108	CONNECTOR 171825-6	JBX0470	1
C1107	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1
PEF-479	PCB PB-1 (PEF-478～486)	HX116440	1
		HX283881	R
		HX283882	R

ELECRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-480)

Symbol	Description	Code	Qty
C1303	C,AL ELYC 25 V 10 UF	CEC0175	1
C1304	C,AL ELYC 25 V 10 UF	CEC0175	1
D1301	DIODE HZ7B	HDH0040	1
D1302	DIODE HZ7B	HDH0040	1
D1303	DIODE 1S2075K	HDS0108	1
D1304	DIODE 1S2075K	HDS0108	1
D1401	DIODE SR103D (WITH MOUNT)	HDS0234	1
R1301	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R1302	R,CARBON 1/4W 220 OHM +-5%	RCR3036	1
R1303	R,CARBON 1/4W 4.7 KOHM +-5%	RCR3068	1
R1304	R,CARBON 1/4W 4.7 KOHM +-5%	RCR3068	1
RV1301	VR,CARBON 1/2W 10KOHM+-20% & 10KOHM+-20% (WITH UL SW)	HX3142075-A	1
RV1302	VR,CARBON 1/2W 10KOHM+-20% & 10KOHM+-20%	HX3142092-A	1
RV1303	VR,CARBON 1/2W 10KOHM+-20% & 10KOHM+-20%	HX3142092-A	1
P1302	CONNECTOR 171825-3	JBX0468	1
P1303	CONNECTOR 171825-6	JBX0470	1
	SPACER FOR TO-1, TO-18 TYPE	H5487338～39	1
C1201	C,AL ELYC 16 V 47 UF	CEC0170	1
C1202	C,CERAMIC 50 V10000 PF+80%-20%	CCC1030	1
C1203	C,PLASTIC 50 V22000 PF+-10%	CQA0099	1
IC1201	IC,ANALOG HA17555GS	ILH0063	1
IC1202	IC,DIGITAL MC14011BCP	IDM0169	1
R1201	R,CARBON 1/4W 10 KOHM +-5%	RCR3076	1
R1202	R,CARBON 1/4W 10 OHM +-5%	RCR3004	1
R1203	R,CARBON 1/4W 27 KOHM +-5%	RCR3086	1
R1204	R,CARBON 1/4W 10 OHM +-5%	RCR3004	1
R1205	R,METAL 1/4W 10.0 KOHM +-1%	RME0676	1
R1206	R,METAL 1/4W 475 OHM +-1%	RME0660	1
R1207	R,CARBON 1/4W 10 OHM +-5%	RCR3004	1

Symbol	Description	Code	Qty
RV1203	VR,CARBON EVL-SOAA00B14	RDE0034	1
RV1205	VR,CARBON EVL-SOAA00B23	RDE0015	1
P1201	CONNECTOR 171825-3	JBX0468	1
P1202	CONNECTOR 171825-3	JBX0468	1
PEF-480	PCB PB-1 (PEF478～486)	HX116440	R
		HX283881	R
		HX283882	R

CIRCUIT BOARD (PEF-481)

Symbol	Description	Code	Qty
R1030	R,CARBON 1/4W 10 KOHM +-5%	RCR3076HA	1
R1031	R,CARBON 1/4W 100 KOHM +-5%	RCR3100HA	1
V1101	CRT 150BCB31	DPX0061	1
J1011	SOCKET PS-085	JSP0001	1
P1030	CONNECTOR 171825-3	JBX0468	1
C1030	C,CERAMIC 50 V 100 PF+-10%	CCC1025VA	1
PEF-481	PCB PB-1 (PEF-478～486)	HX116440	R
		HX283881	R
		HX283882	R

ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-482,483)

Symbol	Description	Code	Qty
S1	SW,SLIDE SSB023 L=9 NS PCB	SSV0042	1
S101	SW,SLIDE SSB023 L=9 NS PCB	SSV0042	1
C1	C,PLASTIC 600 V22000 PF+-10%	CQX0071	1
C101	C,PLASTIC 600 V22000 PF+-10%	CQX0071	1
PEF-482	PCB PB-1 (PEF-478～486)	HX116440	R
		HX283881	R
		HX283882	R
PEF-483	PCB PB-1 (PEF-478～486)	HX116440	R
		HX283881	R
		HX283882	R

ELECTRICAL REPLACEABLE PARTS LIST

CIRCUIT BOARD (PEF-484b)

Symbol	Description	Code	Qty
R880	R,METAL 1/4W 6.81 KOHM +-1%	RME0674	1
R881	R,CARBON 1/4W 820 OHM +-5%	RCR3050	1
R882	R,METAL 1/4W 2.21 KOHM +-1%	RME0668	1
R883	R,METAL 1/4W 1.00 KOHM +-1%	RME0664	1
R884	R,METAL 1/4W 6.81 KOHM +-1%	RME0674	1
R885	R,METAL 1/4W 10.0 KOHM +-1%	RME0676	1
R886	R,METAL 1/4W 1.00 KOHM +-1%	RME0664	1
R887	R,CARBON 1/4W 1.5 KOHM +-5%	RCR3056	1
R888	R,CARBON 1/4W 3.3 KOHM +-5%	RCR3064	1
RV552	VR,CARBON 0.2W 10KOHM +-20% & 50KOHM +-20% (WITH SW)	HX3142080-A	1
RV555	VR,CARBON EVL-SOAA00B14	RDE0034	1
RV556	VR,CARBON EVL-SOAA00B14	RDE0034	1
RV557	VR,WIRE MF220D 2KOHM +-5%	RXM0009	1
	DIAL DFA-N	RZY0002	1
IC810	IC,ANALOG HA17458GS	ILH0054	1
P510	CONNECTOR 171825-6	JBX0470	1
P511	CONNECTOR 171825-6	JBX0470	1
P512	CONNECTOR 171825-3	JBX0468	1
J512	CONNECTOR ASSEMBLY HB	HX3142085-HB	R
PEF-484b	PCB PB-1 (PEF-478~486)	HX116440	R
		HX283881	R
		HX283882	R

ELECTRICAL REPLACEABLE PARTS LIST

CABINET

Symbol	Description		Code	Qty
T1401	XFMR	For V-550	HX3142118-A	1
	BAND	SKB-4M	ERL0093	1
	ADHESIVE AGENT		VEB0003	R
	FASTENER	NYLON	ERL0002	2
	WIRE STICKER	T-25	ERL0012	1
F1401	FUSE	MF61NM 2 (2A 250V)JIS	EFG0352	1
	SOCKET,FUS	SN-1301	EFH0193	1
R1	R,CARBON	1/4W 10 OHM +-5%	RCR3004	1
R101	R,CARBON	1/4W 10 OHM +-5%	RCR3004	1
J1401	COAX.CON	BNC071	JHB0088	1
J1402	COAX.CON	BNC071	JHB0088	1
J1403	COAX.CON	BNC071	JHB0088	1
J1404	COAX.CON	BNC071	JHB0088	1
J1405	COAX.CON	BNC071	JHB0088	1
PEF-485	PCB	PB-1(PEF-478～486)	HX116440	R
			HX283881	R
			HX283882	R
PEF-486	PCB	PB-1(PEF-478～486)	HX116440	R
			HX283881	R
			HX283882	R
TP1401	TERMINAL	BLACK	HX4114183-A	1
TP1402	TERMINAL	Z-048	HX8338351	1
L1101	COIL	For V-550	HX3142116	1
C1205	C,PLASTIC	AMS 102K50 (50V 0.001UF)	CQA0003	1
PL1401~3	LAMP	14V 80MA	HX8329332	3
RV1401	VR,CARBON	EVM-R7GS20B26	RDE0028	1
DL1401	DELAY LINE	758DL 100NS 1860HM	HX8311698	1
J1406	CONNECTOR	CM3 (C-170)	JJC0026	1
P1406	CORD SET	〈For 120V Set〉SVT 3X#18 VM0033-VM0076B 8FEET, GRY	BBZ0184	1
		〈For 220V or 240V Set〉 VM0099-VM0081 8FEET	BBZ0183	(1)
	CORD BAND	CB-3	ERS0004	1

Symbol	Description	Code	Qty
	CONNECTOR ASSEMBLY For V-550	HX3142084 A	1
		HX3142085 A	0
	TERMINAL B5	HX324662 B5	4
	TERMINAL D3	HX324662 D3	1
	BRAIDED WIRE 0.75SQ PLATED TIN	BSE0001	1
	WIRE, NEWFL 1/0.5WHT	BB10042	
	WIRE, VINYL UL-1015#22 YEL	BBA0465	
	WIRE, VINYL WL1H12/0.18 BLK	BBA0041	
	WIRE, VINYL WL1H12/0.18 WHT	BBA0043	
	WIRE PLATED SOLDER	BSB0001	

MECHANICAL REPLACEABLE PARTS LIST

Symbol	Description	Code	Qty	Remarks
1	Cover	288054-A	1	
2	Cover, bottom	3149269-A	1	
3	Chassis, front	117440-AA	1	
4	Chassis, rear	288055-AA	1	
5	Chassis	288056-A	1	
6	Angle	3149270-A	1	
7	Angle	3149271-A	1	
8	Angle	3149272-A	1	
9	Angle	3149273-A	1	
10	CRT band (1)	8330671-A	1	
11	CRT band (2)	3149274-A	1	
12	Plate, shield	3149275-A	1	
13	Bracket, support	8338296-A	1	
14	Bracket, PEF478	8330676-A	1	
15	Bracket, PEF479	3149277-A	1	
16	Bracket	8330677-A	1	
17	Plate, shield	8330678-A	1	
21	Plate, shield	8338330-A	1	
24	Plate	3149278-A	2	
28	Bracket, MD	8345458-A	1	
29	Plate	8345476-A	2	
51	Shield band	8330708-A	1	
69	Rubber	8330710-A	1	
52	Shield case	3149287-B	1	
53	Handle	3156107-A	1	
54	Lock, handle	8345467-A	2	
56	Panel, front	292449~50-A	1	
57	Panel, rear	3149298~99-A	1	
59	Bezel	288060-A	1	
60	Cover, side	3149315-A	2	

Symbol	Description	Code	Qty	Remarks
61	Cover, rear	3149316-A	1	
62	Foot, rear	3149317-A	4	
63	Foot	3140755-A	4	
64	Bush	ERR0073	1	B-312-250
65	Spacer	XCI0097	2	PS-4N(6.4H)
66	Filter	3149318-A	1	
68	Rubber	3144055-B	2	
70	Rubber	8330712-C	1	
71	Cushion	8330711-B	2	
72	Cushion	8330711-F	1	
73	Knob	3149319-A	1	AT
74	Knob	3149320-A	1	BT
75	Knob	3149321-A	6	S18
76	Knob	3149322-B	1	S24
77	Knob	3149323-A	2	URV
78	Knob	3149324-A	4	S18B
79	Knob	3122685-D	2	0022
80	Knob	3149325-B	6	LSW
81	Label	8316162-A	1	SER.NO.
82	Label	8345932-A	1	
83	Rivet	8340163-B	6	NO.1027
84	Rivet	8340164-A	4	NO.113
83	Support	8340165-A	5	LCBS-03N
86	Support	8340165-G	4	LCBS-014N
87	Bush	8340166-A	1	CE-012
90A	Label, 120V	8330692-A	1	U TYPE
90B	Label, 220V	8330693-A	1	E TYPE
90C	Label, 240V	8330694-A	1	K TYPE
301	Screw, sems (sw.w)	XCA0661	8	M3 × 8
302	Screw, sems (sw)	XCA1319	6	M4 × 12

Symbol	Description	Code	Qty	Remarks
303	Screw, sems (sw.w)	8340167-C	4	M4 × 20
306	Screw	XCA6205	3	M2 × 5
308	Screw	XCA6308	21	M3 × 8
309	Screw	XCA6312	3	M3 × 12
310	Screw	XCA1797	2	M3 × 20
311	Screw	XCA6410	2	M4 × 10
313	Screw, black	XCA1820	4	M3 × 10
315	Screw, flat	XCA0168	4	M2.6 × 4
316	Screw, flat	XCA7306	29	M3 × 6
401	Washer, spring	XCA1879	4	M3
402	Washer, spring	XCA1881	2	M4
403	Washer	XCA1855	3	M3
404	Washer	XCA1857	2	M4
405	Nut	XCA1706	4	M3
406	Nut	XCA1707	2	M4
501	Board	PEF-475	1	
18	Bracket, LSW	8330679-A	1	
307	Screw	XCA6306	1	M3 × 6
25	Plate, earth	8318959-A	2	
502	Board	PEF-476	1	
19	Bracket, LSW	8330680-A	1	
307	Screw	XCA6306	2	M3 × 6
503	Board	PEF-477	1	
20	Bracket, LSW	8330681-A	1	
307	Screw	XCA6306	1	M3 × 6
504	Board	PEF-478	1	
27	Heat sink	8329720-A	2	
308	Screw	XCA6308	4	M3 × 8
505	Board	PEF-479	1	
26	Heat sink	8329719-A	3	

Symbol	Description	Code	Qty	Remarks
308	Screw	XCA6308	3	M3 × 8
22	HV case	8330683-A	1	
88	Plate	8340226-A	1	
22B	HV plate	8340247-A		
67	Plate	8340248-A	1	
506	Board	PEF-486	1	
23	Plate	8330684-A	1	

HITACHI DENSHI AMERICA, LTD.*

Headquarters and East Coast Office:
175 Crossways Park West, Woodbury, New York 11797, U.S.A.
Phone:(516)921-7200, TWX:510-221-1879

Northwest Office:
1031 Andover Park West, Tukwila, Washington 98188, U.S.A.
Phone:(206)575-1690, TWX:910-444-2155

West Coast Office:
Victoria Business Park
18005 South Adria Maru Lane, Carson, California 90746, U.S.A.
Phone:(213)538-4880

Midwest Office:
1725 No. 33rd. Ave., Melrose Park, Illinois 60160, U.S.A.
Phone:(312)344-4020, TWX:910-226-0411

Southwest Office:
14169 Proton Road, Dallas, Texas 75234, U.S.A.
Phone:(214)233-7623, TWX:910-860-5775

Southeast Office:
3610 Clearview Parkway, Doraville, Georgia 30340, U.S.A.
Phone:(404)451-9453, TWX:810-757-4228

Central Western Office:
Gateway Plaza, Bldg. No. 3, Suite 505
3538 Peoria, Aurora, Colorado 80010, U.S.A.
Phone:(303)344-3156, TWX:910-932-2993

Washington D.C. Office:
4720 P. Boston Way, Lanham, Maryland 20801, U.S.A.
Phone:(301)459-8262

Cincinnati Office:
11250 Cornell Park Drive, Suite No. 202
Cincinnati, Ohio 45242, U.S.A.
Phone:(513)891-8090

HITACHI DENSHI LTD., CANADA*

Head Office
922 Dillingham Road, Pickering, Ontario, Canada L1W 1Z6
Phone:(416)839-5134, Telex:698-1286

Quebec Office:
8100-G Trans Canada, St. Laurent, Quebec, Canada H4S 1M5
Phone:(514)332-6687, Telex:582-5739

Western Office:
3433-12th St. North-East, Calgary Alberta, Canada T2E 6S6
Phone:(403)276-8508, Telex:382-5861

HITACHI DENSHI EUROPA G.m.b.H.*

Weiskircher Strasse 88
6054 Rodgau-Jugesheim (Raagau), West Germany
Phone:(06106)3027-9, Telex:417-849

HITACHI DENSHI (U.K.) LTD.*

Head Office:
Lodge House, Lodge Road, Hendon, London, England NW4 4DQ
Phone:(01)203-4242, Telex:27449

Leeds Office:
Video House, 55 Manor Road, Leeds, England LS11 5RZ
Phone:0532-30294/5

* Subsidiaries of Hitachi Denshi, Ltd.

www.manualsplus.com
1033829

F NO 4225 Printed in Japan NK TH N